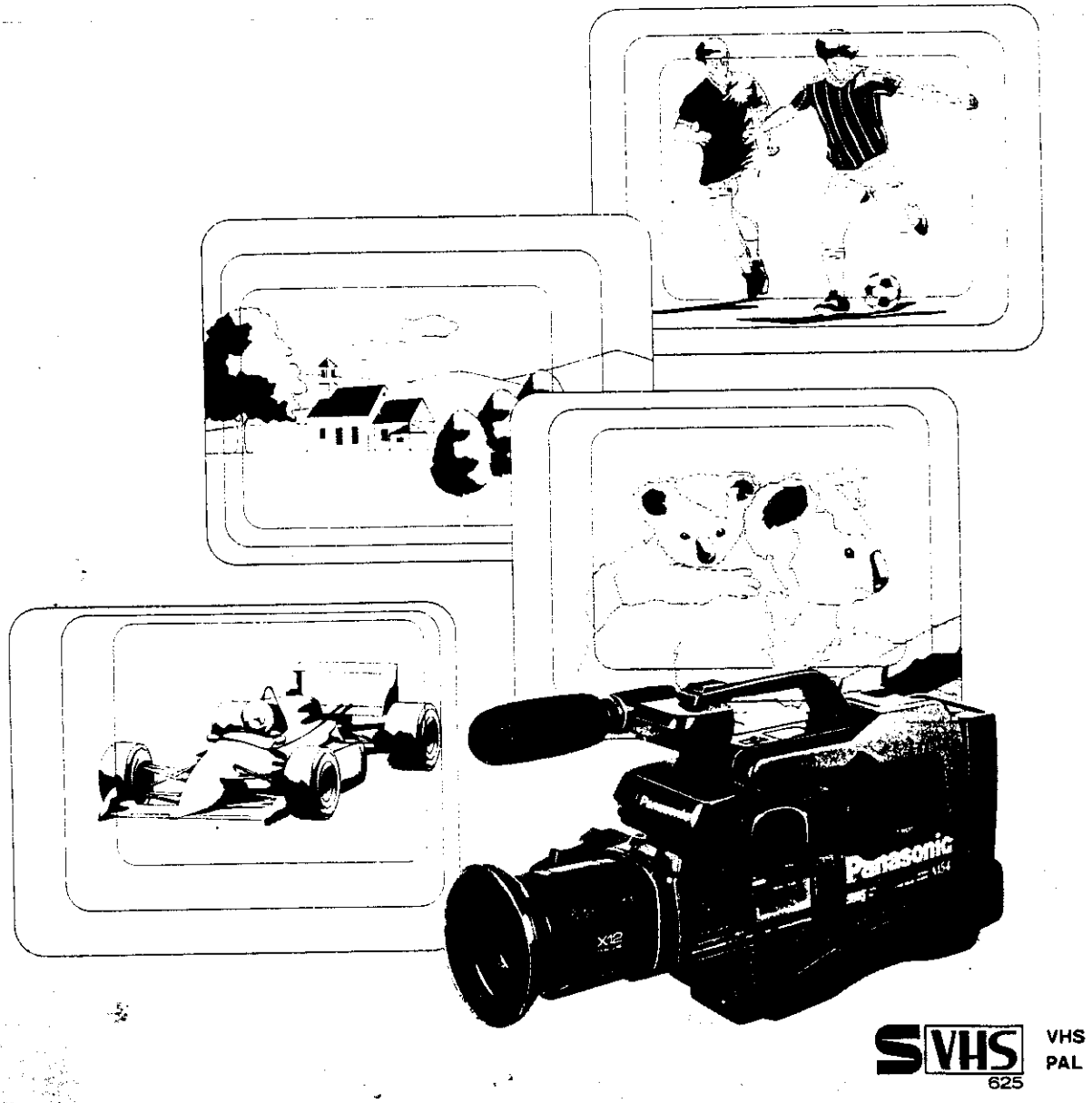
Panasonic

S-VHS Movie

NV-MS4A

Operating Instructions

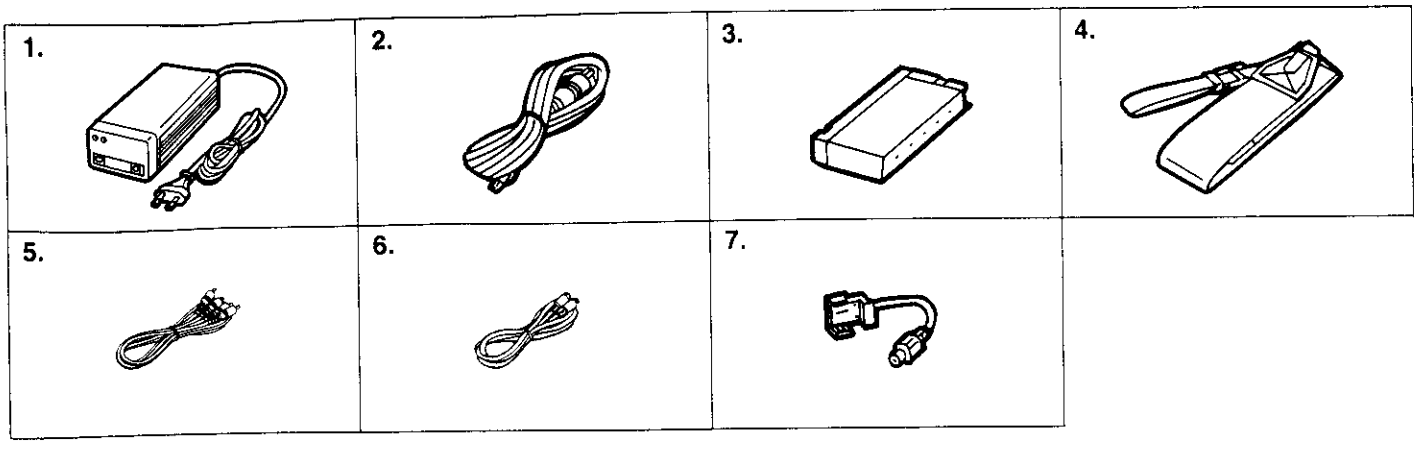


S-VHS 625 VHS PAL

Before attempting to connect, operate or adjust this product, please read these instructions completely.

VQT4836

Checklist for the Standard Accessories



1. **AC Adaptor**
   For supplying power to the Movie Camera or for charging the Battery Pack
2. **DC Input Cable**
   For connection to the AC Adaptor
3. **Battery Pack**
   For supplying power to the Movie Camera
4. **Shoulder Strap**
5. **Audio/Video Cable**
   For connection to a TV set
6. **S-Video Cable**
   For connection to a TV set
7. **Battery Pack Charging Connector**
   To recharge the Battery Pack, connect it to the AC Adaptor with this connector.

CAUTION: **TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE ONLY THE RECOMMENDED ACCESSORIES.**

Information for your safety

Please read these Operating Instructions carefully-especially the cautions on page 57 and thereafter-before using the Movie Camera for the first time. Keep these Operating Instructions handy for later reference, in case you want to look up something in the future.

Cautions:
Injury or material damage resulting from any kind of use that is not in accordance with the operating procedures explained in the Operating Instructions are the sole responsibility of the user.

HQ(High Quality) Picture System
Video recorders carrying the HQ symbol mark feature the new VHS High Quality Picture System. This system assures complete compatibility with VTRs that use the conventional VHS system.

Information for Your Safety

IMPORTANT
Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

S-VHS Movie NV-MS4
- **The rating plate is on the bottom side of the Movie Camera.**

AC Adaptor VW-AM10
- **The rating plate is on the bottom side of the unit.**

FOR YOUR SAFETY

■ **DO NOT REMOVE THE OUTER COVER.**
To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacturer's instructions.

Video cassettes recorded in the S-VHS mode can be played back on this Movie Camera and on other S-VHS VTRs (Video Tape Recorders).
However, they cannot be played back on VHS VTRs.
For more details, see page 10.

IF THE SUPPLY CORD OF THIS EQUIPMENT IS DAMAGED, IT MUST BE REPLACED BY THE SPECIAL CORD.

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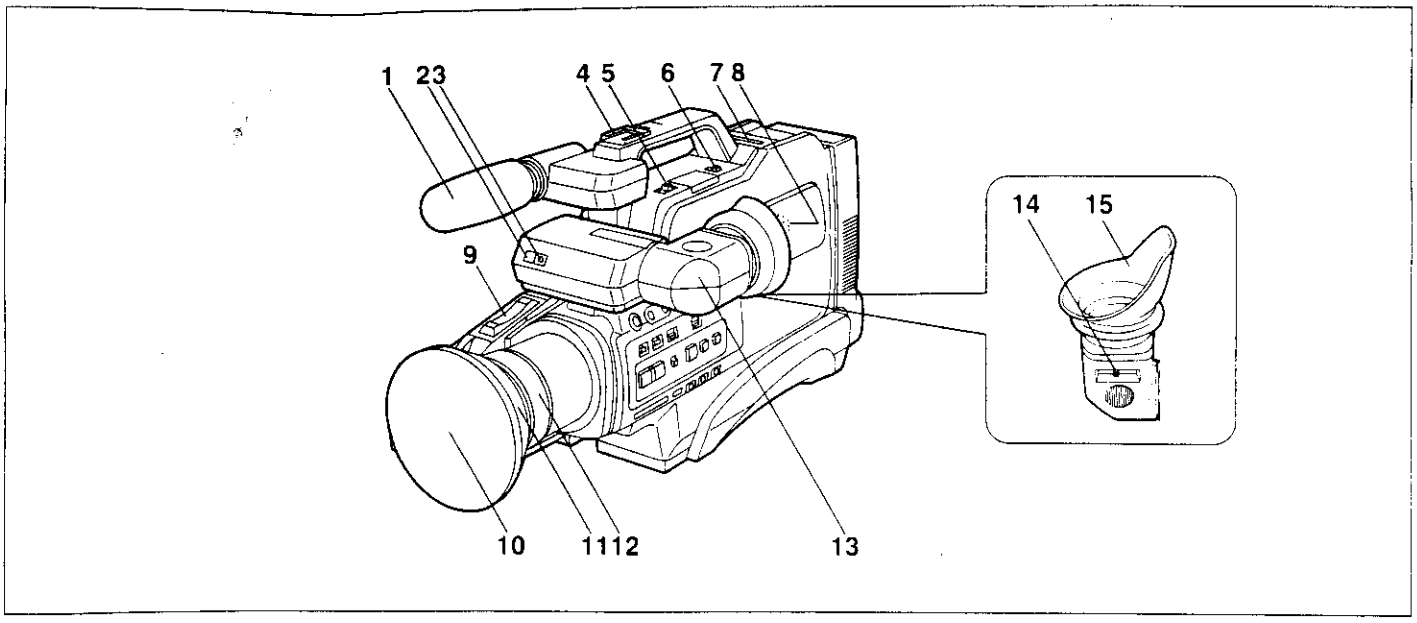


Controls and Functions

1 **Stereo Microphone**

2 **White Balance Sensor Window**

3 **Tally Lamp**
It is lit during shooting to inform the people in front of the Movie Camera that shooting is under way.

4 **Accessory Shoe**
Some optional accessories (External Microphone, etc.) can be attached to this Accessory Shoe.

5 **Operation Switch [OPERATE]**
For turning the Movie Camera on and off.

6 **S-VHS System Selector Switch [S-VHS ON/AUTO/OFF]**
The selected recording system can be selected by sliding the [S-VHS ON/AUTO/OFF] Switch to the corresponding position.

7 **CAMERA/VTR Selector Cover [CAMERA/VTR]**

8 **Built-in Speaker**

9 **Zoom Buttons**
Press these buttons to gradually zoom in and out.

10 **Lens Cap**

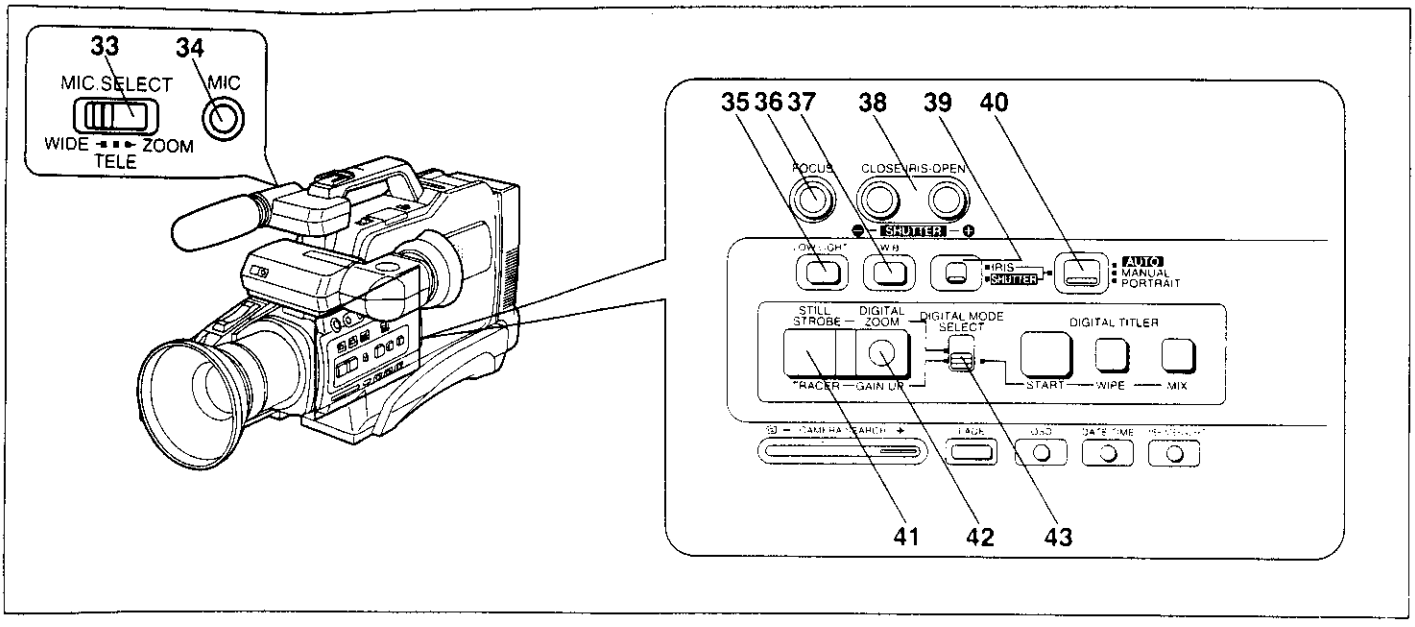
11 **Lens Hood**

12 **Focus Ring**
After selecting the manual focusing mode with the [FOCUS] Button, adjust the focus to the desired subject by turning this ring.

13 **Viewfinder**
The subject in front of the camera can be seen on the viewfinder screen.

14 **Eyepiece Corrector**
Adjust the Eyepiece Corrector to your eyesight so that the picture and indications in the Viewfinder become as clear and sharp as possible.

15 **Eyecup**



Controls and Functions (cont'd)

33 Microphone Mode Selector Switch [MIC.SELECT WIDE/TELE/ZOOM]

34 External Microphone Socket [MIC]

35 Low Light Button [LOW LIGHT]
For shooting evening scenes and other scenes in low light conditions.

36 Focus Button [FOCUS]
Press this button to select manual focus adjustment for shooting.

37 White Balance Button [W.B]
Press this button to select manual white balance adjustment.

38 Iris Close Open/Shutter −/+ Button
The iris value and the shutter speed can be adjusted manually by pressing these buttons.

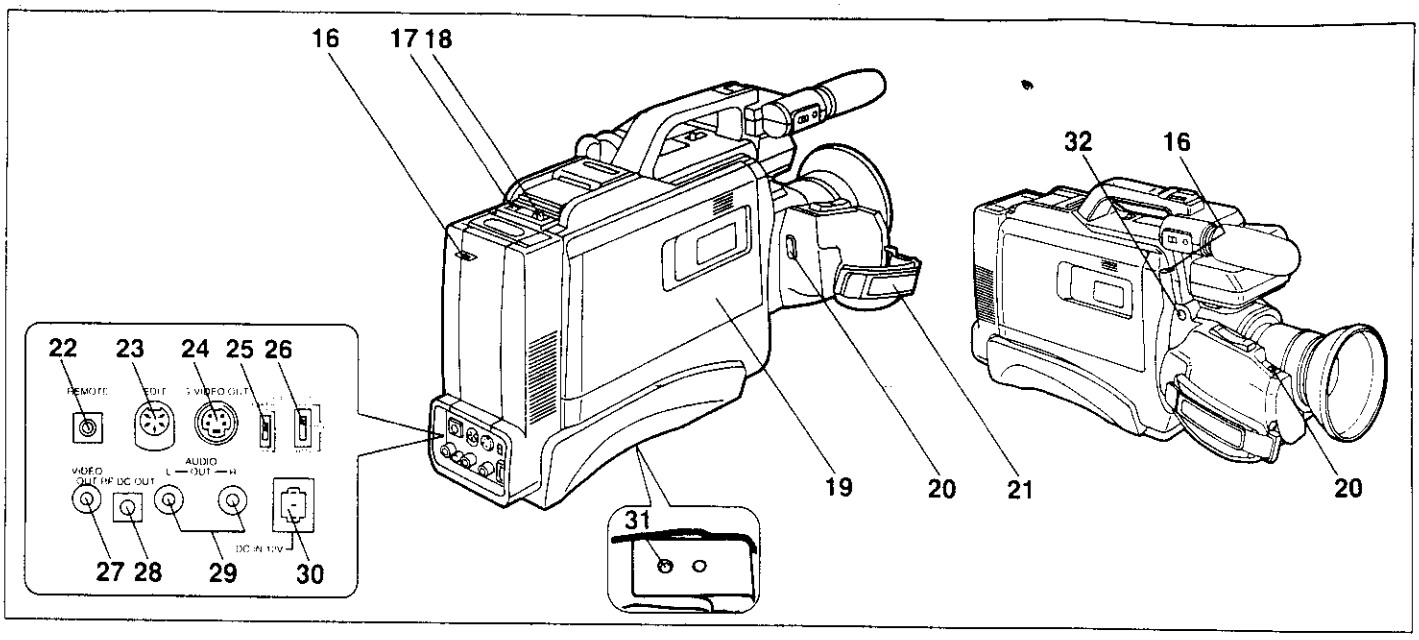
39 Selector Switch for the Iris/Shutter Speed Adjustment Function [IRIS/SHUTTER]
The Iris Adjustment Function and the High-Speed Shutter Adjustment Function can be selected with this button.

40 Mode Selector Switch [AUTO/MANUAL/PORTRAIT]
Use this selector switch to select the automatic, manual or portrait shooting mode.

41 Still/Strobe/Tracer Button [STILL/STROBE]/[TRACER]
Depending on the setting of the [DIGITAL MODE SELECT] Switch, this button can be pressed for shooting still pictures and pictures with strobe effect or with an intentional after-image effect.

42 Digital Zoom/Gain Up Button [DIGITAL ZOOM]/[GAIN UP]
Depending on the setting of the [DIGITAL MODE SELECT] Switch, this button can be pressed to increase the power of the power zoom function or to increase the sensitivity when shooting in the dark.

43 Digital Mode Selector Switch [DIGITAL MODE SELECT]
Use this switch to select the desired Digital Shooting Function.



Controls and Functions (cont'd)

16 Shoulder Strap Holders

17 Tape Eject Button [TAPE EJECT]
To insert or take out a video cassette, press this button.

18 Battery Pack Eject Button [BATT.EJECT]
Press this button when removing the Battery Pack.

19 Cassette Compartment
Insert a video cassette into this compartment.

20 Start/Stop Button
Press this button to start and stop shooting a scene.

21 Grip Belt

22 Remote Control Socket [REMOTE]

23 Edit Socket [EDIT]
Connect an Editing Controller, etc. to this socket.

24 S-Video Output Socket [S-VIDEO OUT]

25 Speaker On/Off Switch [SPEAKER ON/OFF]

26 Audio Selector Switch [HiFi/MIX/NORMAL]

27 Video Output Socket [VIDEO OUT]

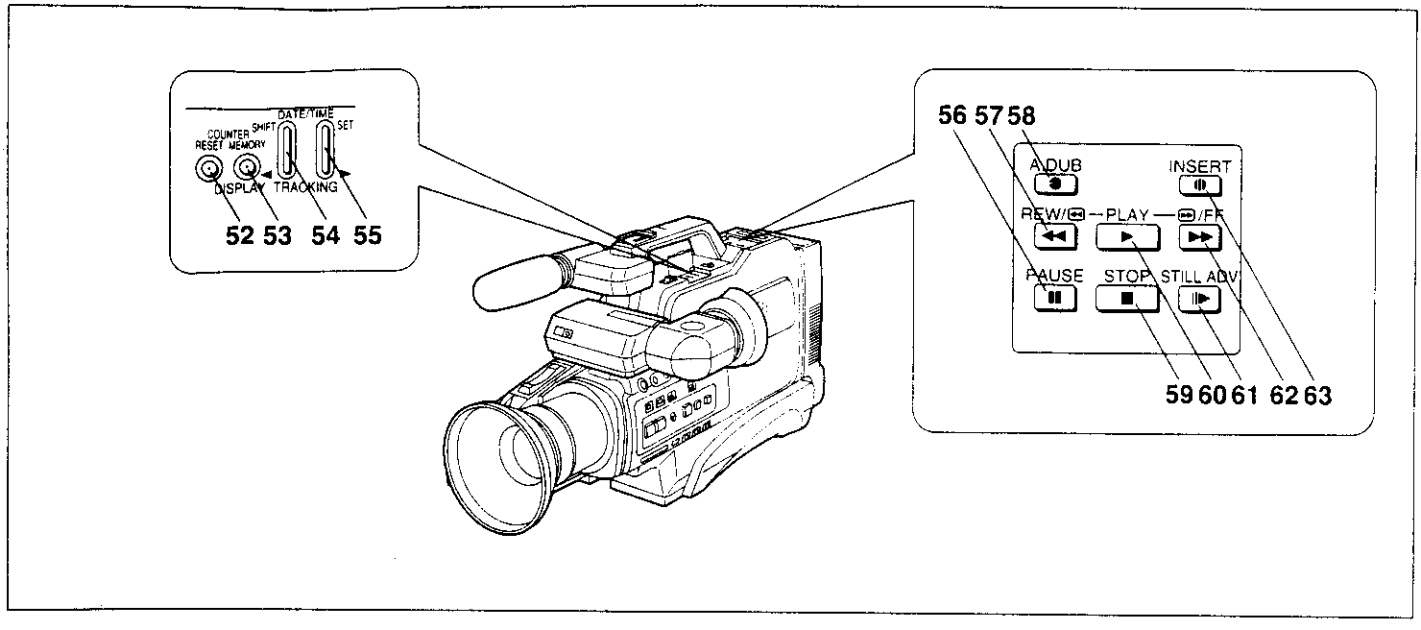
28 RF DC Output Socket [RF DC OUT]

29 Audio Output Socket [AUDIO OUT]

30 DC Input Socket [DC IN 12 V]
Connect the DC Input Cable to this socket.

31 Tripod Receptacle
When using a tripod for stable shooting, attach the screw of the tripod to this receptacle.

32 Charactor Generator Socket [CHAR.GEN]
Connect a Charactor Generator (optional).



Controls and Functions (cont'd)

52 Reset Button [RESET]
Press this button to reset the tape counter to "0000".

53 Memory Button [MEMORY/DISPLAY]
Press this button to activate the Tape Counter Memory Function.

54 Tracking/Date/Time Shift Button [DATE/TIME SHIFT • TRACKING]
1) Press it to advance to the next item during the setting of the time and date.
2) Press it when you want to adjust the tracking manually.

55 Tracking/Date/Time Set Button [DATE/TIME SET • TRACKING]
1) Press it to change the figures during the setting of the time and date.
2) Press it when you want to adjust the tracking manually.

56 Pause Button [PAUSE]
Press this button during playback to be able to watch a still picture.

57 Rewind/Review Button [REW/⏮]
Press this button to rewind the tape.

58 Audio Dubbing Button [A.DUB]
Press this button to add new sound on a recorded tape with the Audio Dubbing Function.

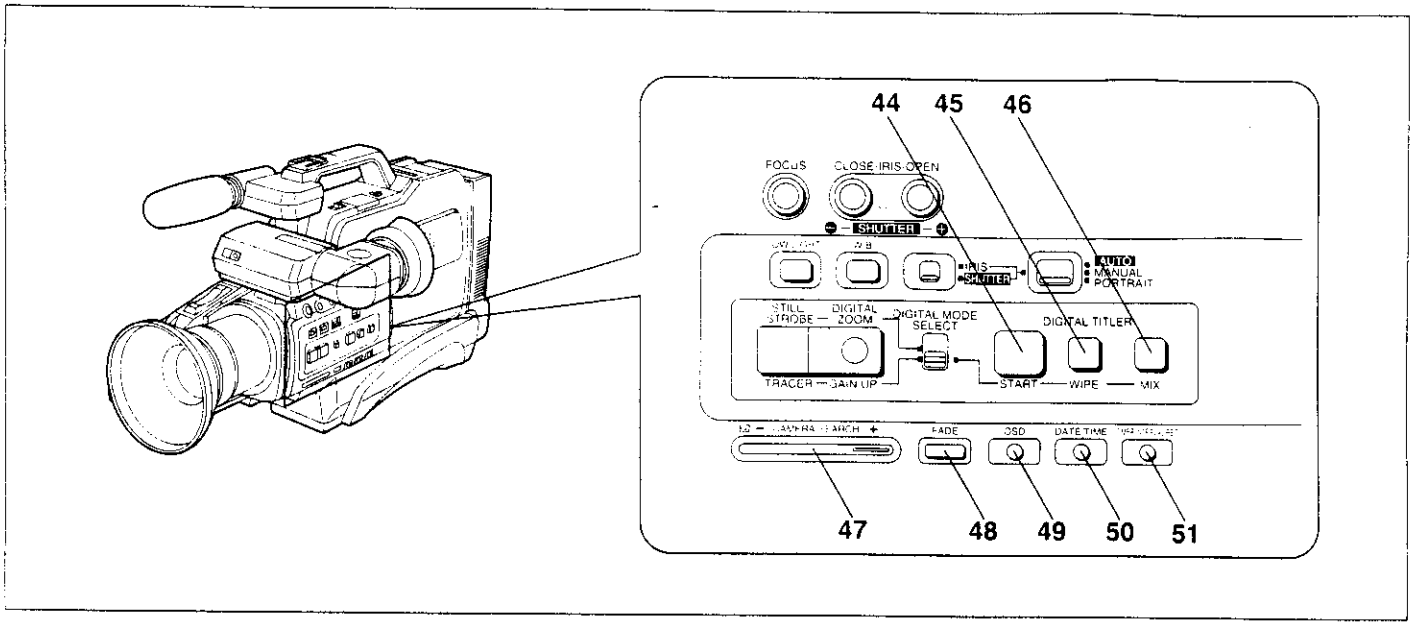
59 Stop Button [STOP]
Press this button to stop the playback.

60 Play Button [PLAY]
Press this button to start the playback.

61 Still Advance Button [STILL ADV]
After pressing the Pause Button, press this button to advance the still picture frame by frame.

62 Fast Forward/Cue Button [⏭/FF]
Press this button to wind the tape forward.

63 Insert Button [INSERT]
Press this button to insert new scenes on a previously



Controls and Functions (cont'd)

44 Digital Start Button [START]
To start the Digital Wipe Function or the Digital Mix Function, press this button.

45 Digital Wipe Button [WIPE]
Press this button for a horizontal wipe transition from a moving picture to a still picture from the memory, or vice-versa.

46 Digital Mix Button [MIX]
Press this button to gradually fade over from the moving picture to a still picture from the memory, or vice-versa, or to combine the two pictures.

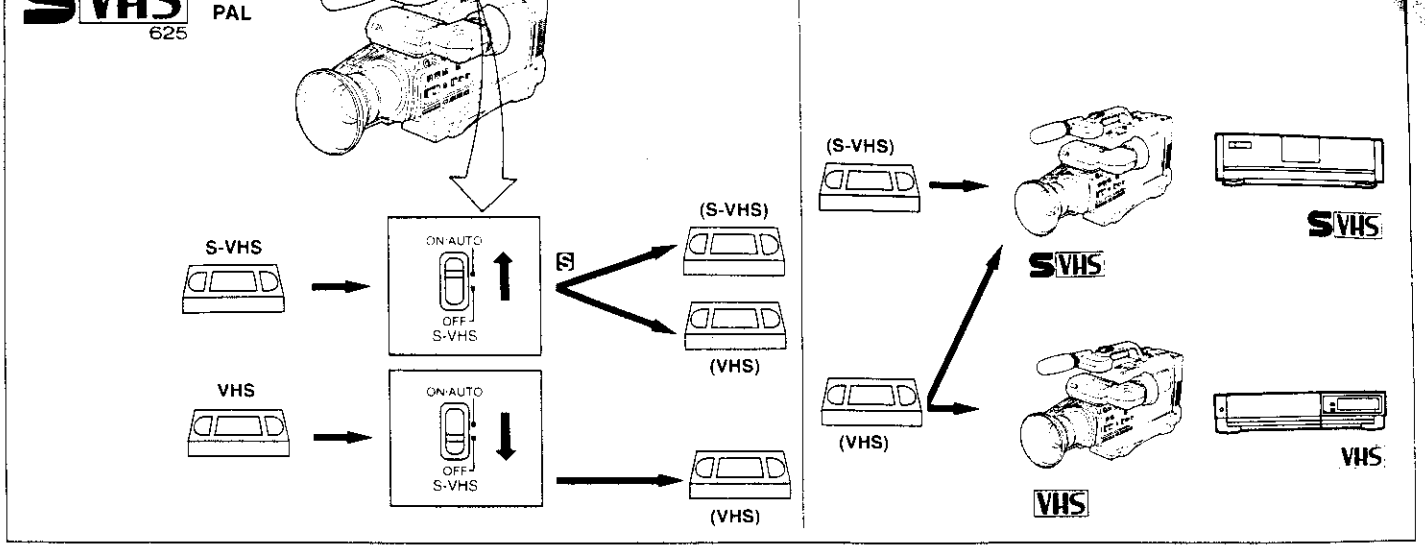
47 Camera Search Button [⊜ /– CAMERA SEARCH +]
Keep these buttons pressed to play back recorded scenes at high speed in reverse direction or at normal speed in forward direction.
To check the last few seconds of the last recorded scene, press the [– CAMERA SEARCH] Button briefly.

48 Fade Button [FADE]
Press this button to fade out a scene and to fade in the following scene for a soft scene-to-scene transition.

49 On-Screen Display Button [OSD]
Press this button to make the indications in the Viewfinder disappear.

50 Date/Time Button [DATE/TIME]
Press this button to make the time and/or date appear in the Viewfinder and superimpose them onto the picture during shooting.

51 Interval Button [TIMER/INTERVAL REC]
Press this button to activate the Self-Timer and Interval Shooting Functions.



S-VHS Format

■ About the S-VHS Format

The S-VHS video format is the new video system that fulfills the exceedingly high demands and expectations of today's video-information age. It is newly developed based on the VHS video format established throughout the world for home use, and it employs a wealth of latest technology to provide higher resolution and picture quality. The newly developed, high-performance S-VHS video cassette tapes enable the S-VHS format to realize truly epoch-making improvements in overall picture quality and clarity.
This S-VHS Movie Camera allows high picture quality recording and playback by using the video cassettes carrying the S-VHS logo as well as conventional VHS recording and playback on the video cassettes bearing the VHS logo.

Compatibility of VTRs and Tapes

■ When recording

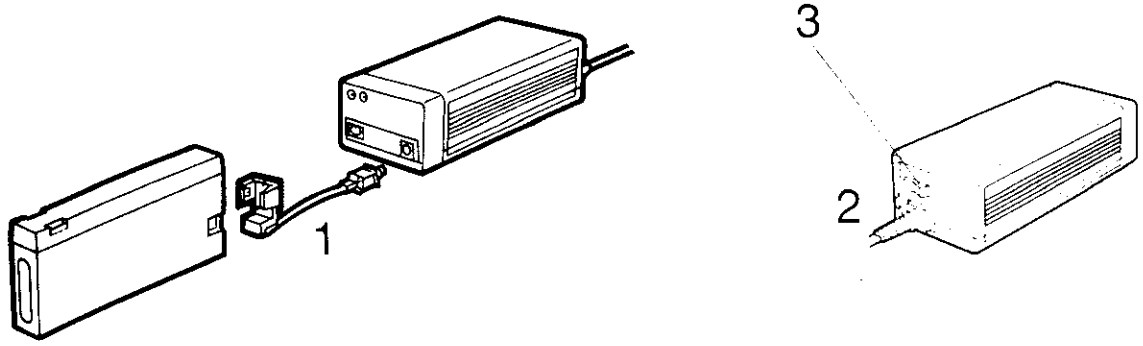
When using an S-VHS video cassette for recording, the recording format (S-VHS or VHS) can be selected as follows with the [S-VHS ON/AUTO/OFF] Switch.

"S"	S-VHS format
No indication	VHS format

- The Indication "S" is displayed in the Viewfinder.

■ When Playing Back

- Tapes recorded in the S-VHS format can be played back on this Movie Camera or on other S-VHS VTRs. (However, they cannot be played back on VHS VTRs.)
- Tapes recorded in the VHS format can be played back on VHS VTRs as well as on this Movie Camera and on other S-VHS VTRs.
- The video format in which the video cassette was recorded will automatically be detected and selected for playback.
- If the setting of the [S-VHS ON/AUTO/OFF] Switch is changed during shooting, some picture distortion will occur at that tape position during playback.



Using the Battery Pack

■ Charge the Battery Pack

1 **Connect the Battery Pack and the AC Adaptor with the Battery Pack Charging Connector.**

2 **Connect the Power Cable of the AC Adaptor to the Mains.**

3 **Turn the AC Adaptor on.**

Notes:

- When the AC Adaptor is connected to the Movie Camera and the Movie Camera is turned off, it is possible to charge two Battery Packs simultaneously—one connected to the AC Adaptor and the other inserted into the Movie Camera. However, charging them at the same time takes twice as long as charging only one Battery Pack.
- Charge the Battery Pack within a temperature range of 10°C–35°C.
- Charging 2 Battery Packs simultaneously takes twice as long as charging 1 Battery Pack alone.

Charging Indication Lamp:

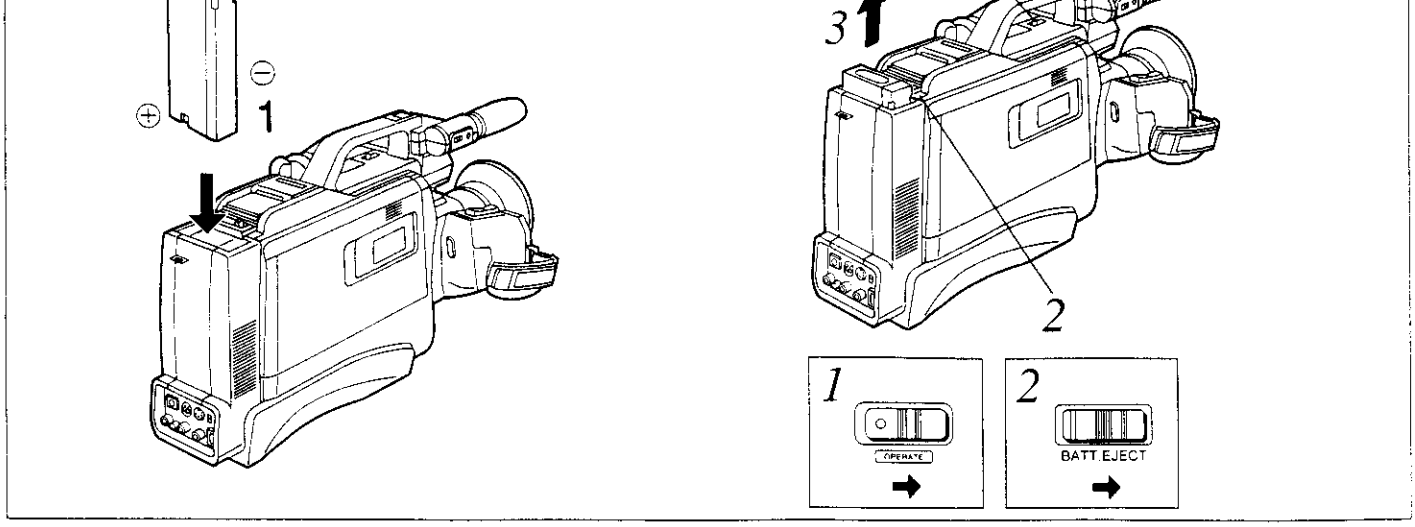
When charging is started, the red lamp lights up. When about 45 minutes of charging time remain, the lamp will change to green. The Charging Indicator will go out about 100 minutes after charging starts. However, the Battery Pack should be charged at least 3 hours for extended use.

Operation Time:

With a fully charged Battery Pack (VW-VBF2E), the Movie Camera can be used (in record mode only) continuously for approx. 110 minutes at 25°C. However, depending on how often the various functions listed below are used, and depending on the shooting conditions, the actual operation time may be considerably shorter.

- Shooting start/stop
- Auto focus
- Zoom function
- Playback, fast forward, rewind, and other operations
- Digital functions
- Use of the Movie Camera in low temperature

Therefore, it is recommended to take along a charged spare Battery Pack.



Using the Battery Pack (cont'd)

■ How to Insert the Battery Pack

1 **Insert the Battery Pack until it locks with a click.**

Note:
Insert the Battery Pack with its + side facing the rear of the Movie Camera.

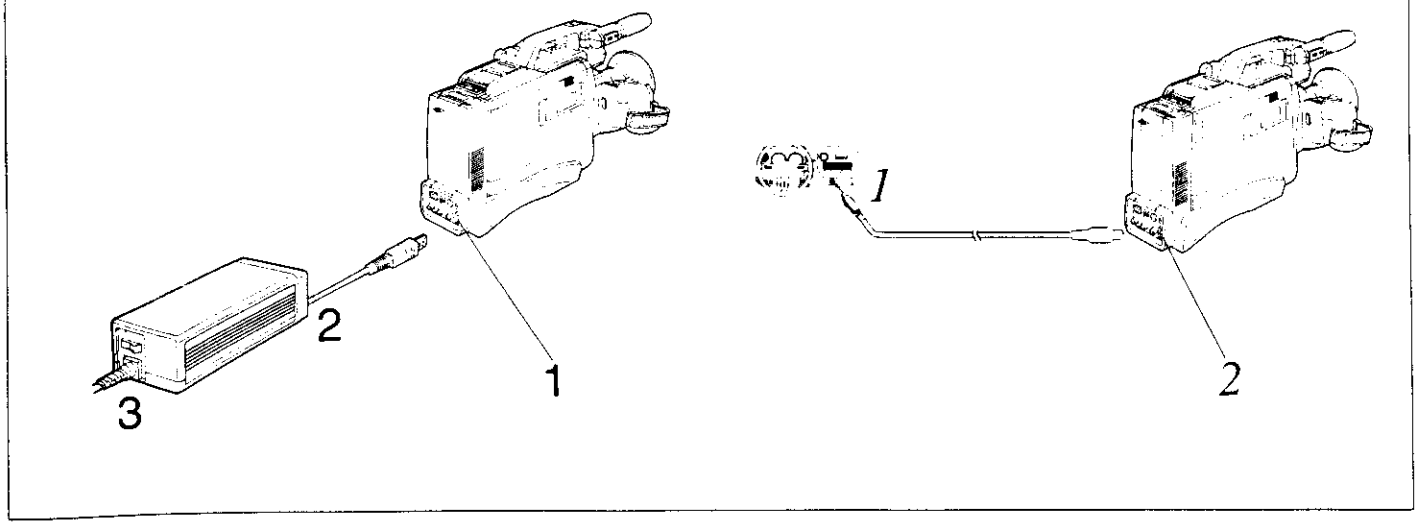
■ How to Remove the Battery Pack

1 **Turn the Movie Camera off.**

2 **Slide.**

3 **Pull of the Battery Pack.**

Caution:
If the Battery Pack is removed during recording or playback, the tape remains wound around the video head cylinder and could become damaged.
This is also the case during the loading and unloading of the tape.



Using the AC Adaptor or the Car Battery Cord (optional)

■ How to Use the AC Adaptor

1 **Connect the DC Input Cable to the DC Input Socket on the Movie Camera.**

2 **Connect the other end of the cord to the DC Input Socket on the Movie Camera.**

3 **Connect the Mains Cable of the AC Adaptor to the mains.**

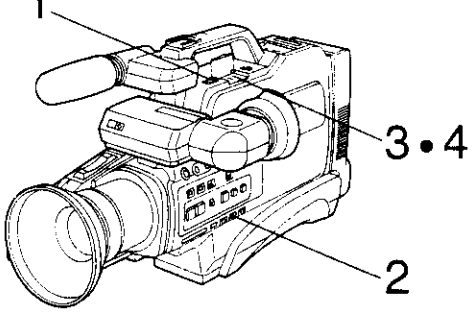
Note:
When the Movie Camera is turned off, the charging of the Battery Pack inserted into the Movie Camera starts.

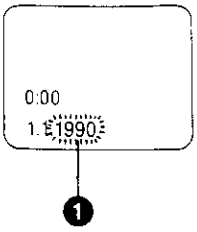
■ How to Use the Car Battery Cord (optional)

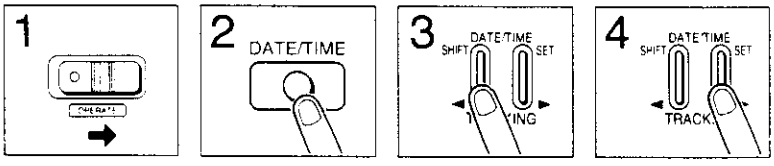
1 **Start the engine and then plug the Car Battery Cord into the Cigarette Lighter Socket.**

2 **Connect the other end of the cord to the DC Input Socket on the Movie Camera.**

Notes:
- The Car Battery Cord can only be used with 12 V DC negative-grounded vehicles.
- Do not start the car engine while the Movie Camera is powered by the car battery.







Setting the Clock

■ How to Set the Date and Time

At the time of purchase, the clock does not show the correct time and must first be adjusted.

1 Turn the Movie Camera on.

2 Press.

3 Keep pressed for more than about 2 seconds.

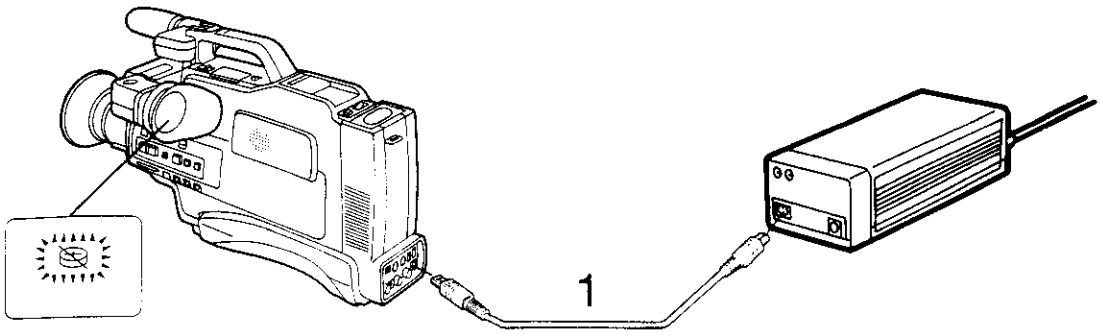
- The year portion ❶ of the Date/Time Indication starts to flash.
- The flashing portion of the Date/Time Indication can be changed with the [SHIFT] Button in the following order:

→Year→Month→Day→Hour→Minute→" "→

4 Press to change the figures.

Year:	**1990**→1991→ . . . . . →2089→**1990**→...
Month:	1→2→ . . . . . →12→1→...
Day:	1→2→ . . . . . →31→1→...
Hour:	0→1→ . . . . . →23→0→...
Minute:	**00**→01→ . . . . . →59→**00**→...

- Repeat procedures **3** and **4** until all items have been set correctly.
- Once the date and time are set, press the [SHIFT] Button in response to an accurate time source so that the clock begins to function.



Setting the Clock (cont'd)

■ The Built-in lithium battery

A built-in rechargeable lithium battery maintains the operation of the built-in clock when the Movie Camera is turned off. When the Movie Camera is in operation, this battery is recharged automatically.
However, if the Movie Camera is not used for a very long time, the lithium battery can become exhausted. In this case, the Indication "⊗" in the Viewfinder flashes and the date and time return to the initial Indication "1.1.1990".

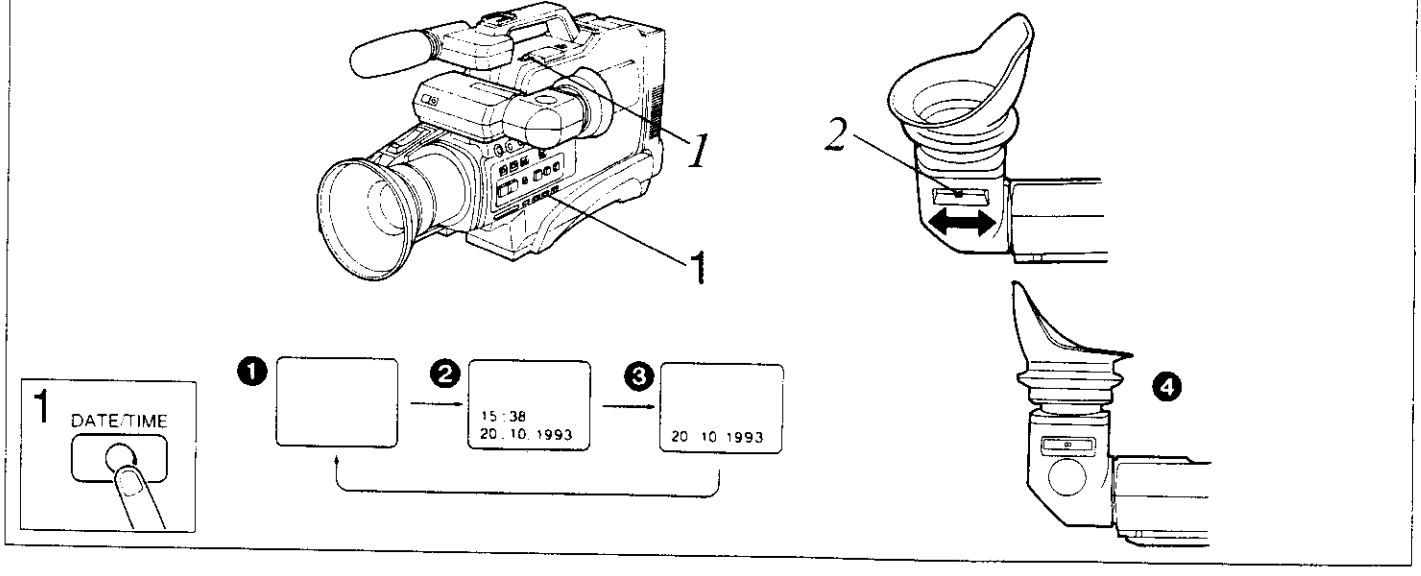
■ How to Recharge the Built-In Lithium Battery

If the Indication "⊗" in the Viewfinder flashes for approx. 10 seconds when turning the Movie Camera on, the lithium battery needs to be recharged as follows:

1 Connect the Movie Camera to the AC Adaptor or insert the Battery Pack into the Movie Camera.

2 Leave the Battery Pack in the Movie Camera for 20 hours.
The Movie Camera does not need to be turned on.

- When the lithium battery is fully charged, it can maintain the operation of the clock for approx. one year.

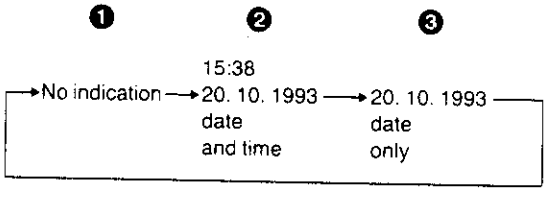


Recording the Date and Time during Shooting

During shooting, the Date/Time Indication displayed in the Viewfinder will also be recorded.

1 Press.

- At each press of the [DATE/TIME] Button, the Date/Time Indication in the Viewfinder can be changed in the following order:



- Press the [DATE/TIME] Button to select the desired indication.

Adjusting the Eyepiece Corrector

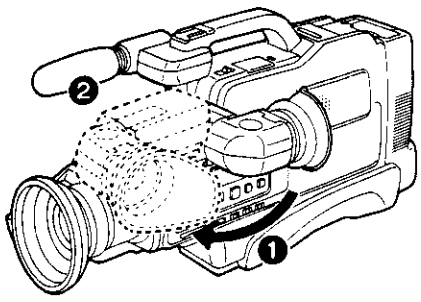
1 Turn the Movie Camera on.

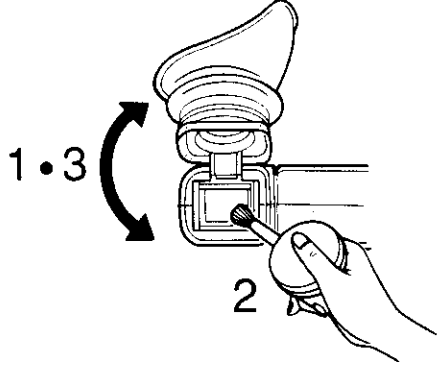
2 Slide the control until the indications in the Viewfinder can be seen clearly.

- With the Eyepiece Corrector Control, the Eyepiece can be adjusted to your eyesight.

Notes:

- Do not apply any pressure to the Viewfinder except when folding it up, raising, lowering and folding down.
- For viewing the picture in the Viewfinder with the left eye, remove the Eyecup and attach it with its longer side facing left ❹.





Viewfinder

■ Setting the Viewfinder to its Shooting Position

Turn the Viewfinder backward by 90° so that the Eyecup faces backward.

- The angular part of the Viewfinder can be turned upward and downward by 90° each.
- To be able to watch the picture in the Viewfinder without holding the Viewfinder close to the eye, swing up the Eyecup.
- By pulling on the Viewfinder it can be extended further outside to a position that is most comfortable for shooting.

■ Returning the Viewfinder to its Original Position

❶ Turn it forward toward the Lens.

❷ Retract the Viewfinder by pushing it back toward its base.

Cleaning

1 Swing up the eyecup.

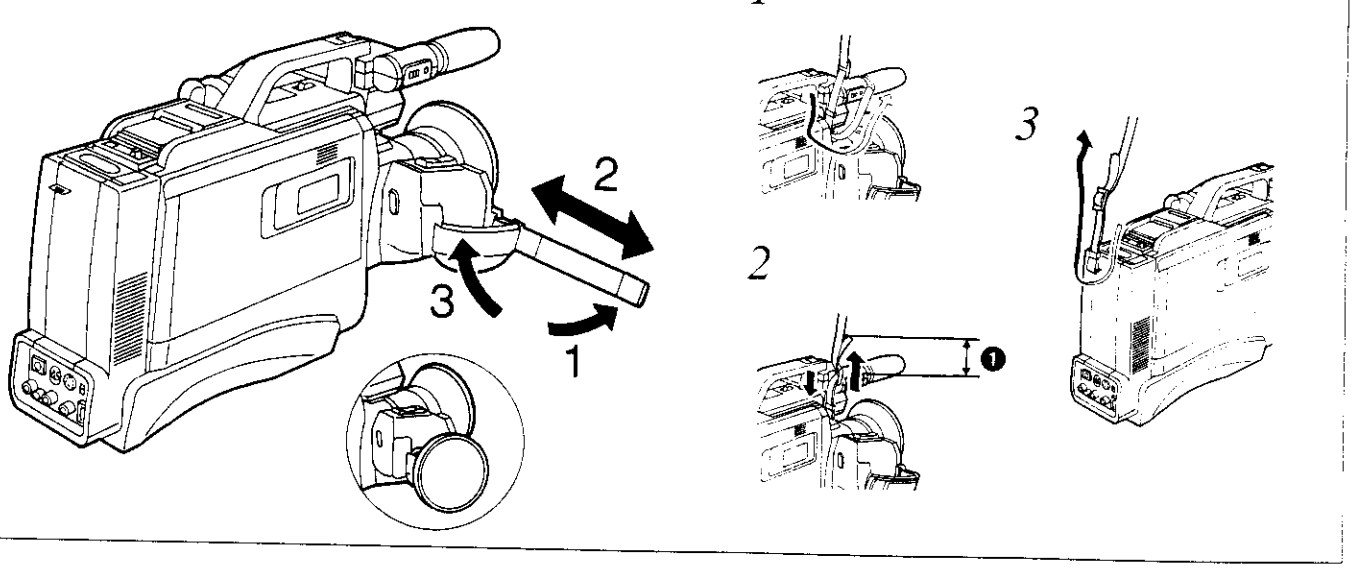
2 Remove dust with a blower brush.

3 Swing down the eyecup.

- Clean the lens only with a blower brush (used for photo cameras) or special lens cleaning tissue (used for glasses and cameras).
- Wipe the Movie Camera with a clean, dry cloth. Never use cleaning fluid or other chemicals.

■ Cautions for Cleaning

Do not use benzine, thinner or other chemicals for cleaning, because they could change the colour and damage the surface of the camera body.
When using a chemically treated cloth for cleaning, carefully follow the instructions for its use.



Adjusting the Grip Belt

■ **Adjusting the Length of the Grip Belt**

The length of the Grip Belt should be adjusted so that the Grip fits comfortably into the palm of your hand and the Start/Stop Button and the [W] and [T] Zoom Buttons can easily be pressed with the fingertips.

1 **Unfasten the velcro tape closure.**

2 **Adjust the length to the size of your hand.**

3 **Fasten the velcro tape closure.**

Note:

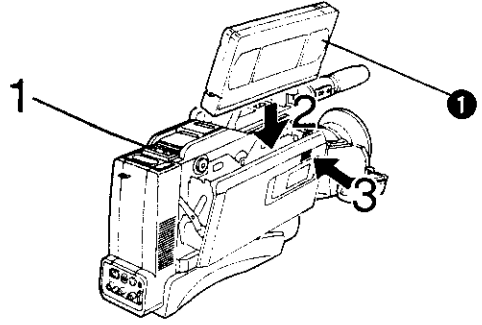
- Attach the Lens Cap to the Grip Belt. (Hook the clip part on the back of the Lens Cap onto the Grip Belt.)

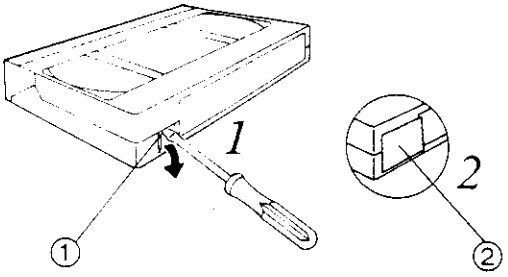
Attaching the Shoulder Strap

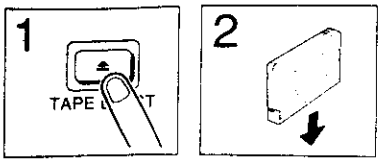
1 **Pull the end of the Shoulder Strap through the Shoulder Strap Holder.**

2 **Securely attach the end of the Shoulder Strap. (❶ More than 2 cm)**

3 **Attach the other side in the same way.**







Inserting the Video Cassette

■ How to Insert the Video Cassette

- Use only S-VHS / VHS Video Cassettes.

1 Press.

- After a few seconds before the Cassette Compartment Cover opens.

2 Insert the video cassette with the cassette window ❶ facing outside.

3 Close the Cover until it locks with a click.

■ How to Eject the Video Cassette

Make sure that power is supplied to the Movie Camera.

1 **Press the [TAPE EJECT] Button.**

2 **Pull out the Video Cassette.**

3 **Close the Cover until it locks with a click.**

■ Preventing Accidental Erasure of Recordings

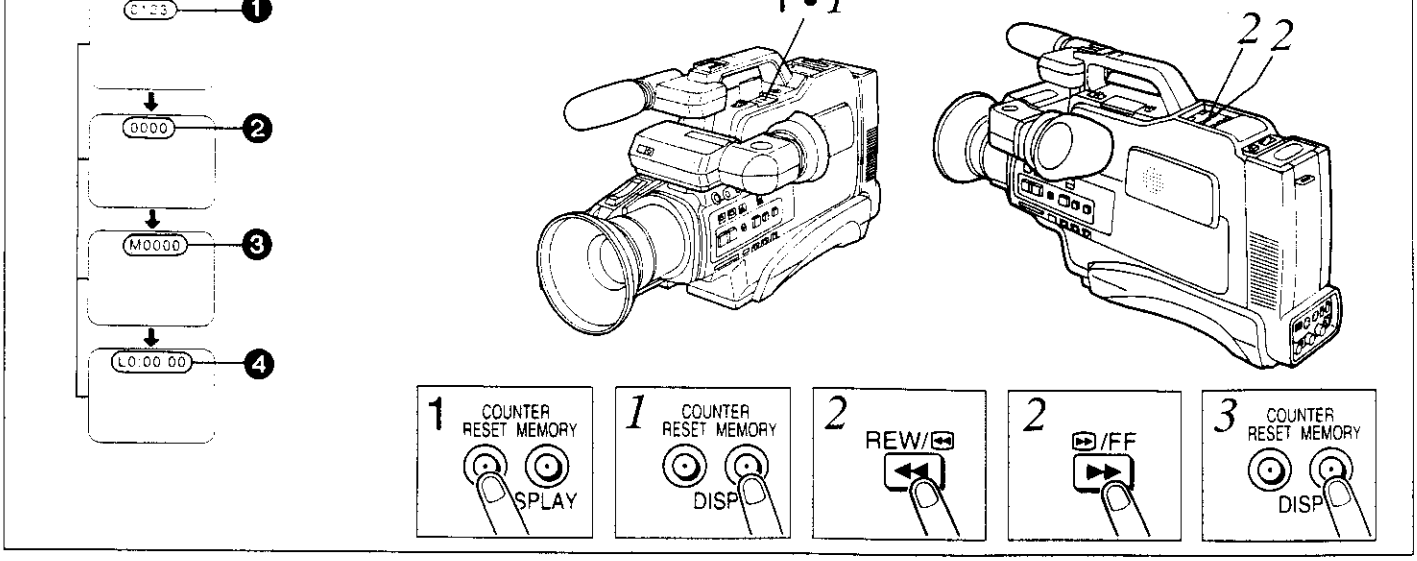
When recording on a previously recorded tape, the previously recorded contents will be erased and replaced by the new recording. An important recording can be protected against accidental erasure, by breaking out the tab ①. If the tab is removed, recording on this Video Cassette is no longer possible.

■ How to Break off the Tab

1 **Break off the tab with a screwdriver in the direction of the arrow.**

■ How to Record Again onto a Video Cassette with Removed Tab

2 **Cover the hold firmly with two layers of adhesive tape ②.**



Using the Tape Counter Indication

The Tape Counter Indication ❶.

■ How to Reset the Tape Counter to "0000"...

1 Press.
The Tape Counter is reset to "0000" ❷.

■ How to Search for the Tape Position "0000" After Shooting or Playback...

1 Press.
- The "M" Indication ❸ appears in the Viewfinder next to the Tape Counter Indication.

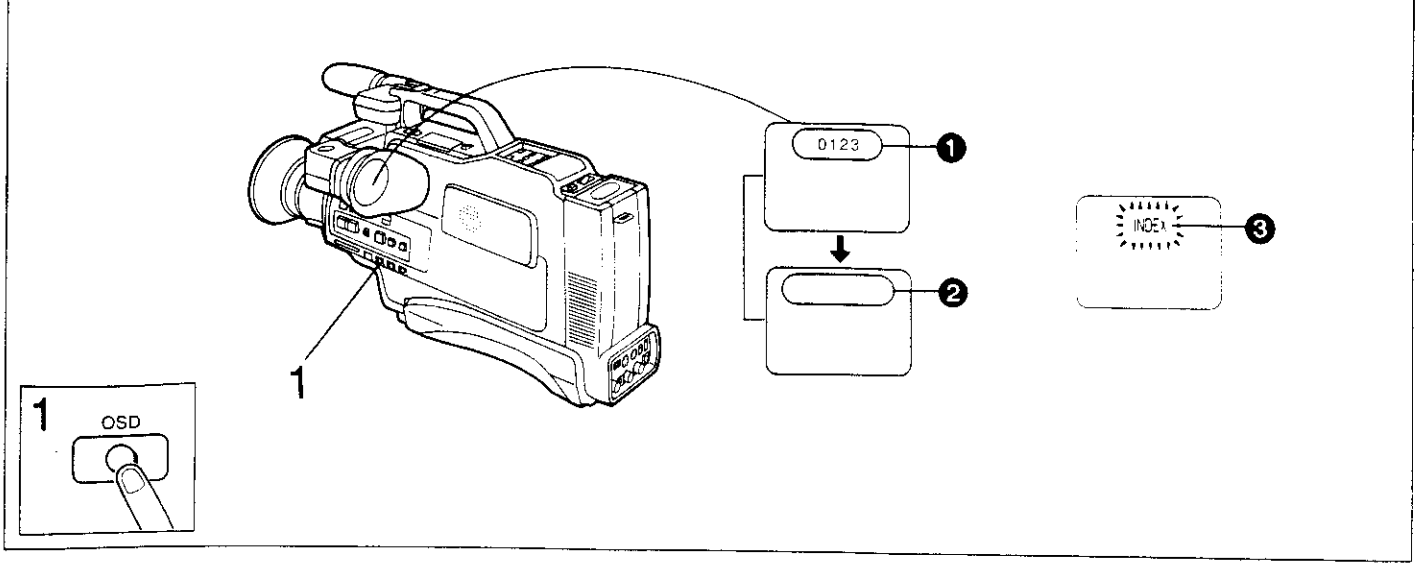
2 Press one of the two Buttons.
- The tape stops automatically at about the point where the Tape Counter reads "M 0000".

■ How to Make the Lap Time Counter Indication Appear

3 Press again.
The Lap Time Counter Indication "L 0:00.00" (real time) ❹ appears.
- The Lap Time Counter counts up only during recording.

Note:
- When fast forward or rewind to "M 0000" position, the tape counter may not read exactly "M 0000" when the tape stops. This is not a malfunction.

■ To Cancel the Memory Function...
Press the [MEMORY/DISPLAY] Button twice.



Using the On-Screen Display Function

■ How to Turn off the Indications in the Viewfinder

1 Press.

- The indications in the Viewfinder disappear ❷ except the Warning and Alarm Indications, the Date/Time Indication and the Manual White Balance Indications.

■ To Return to the Initial Mode...

Press the [OSD] Button again.

Index Signals (VISS)

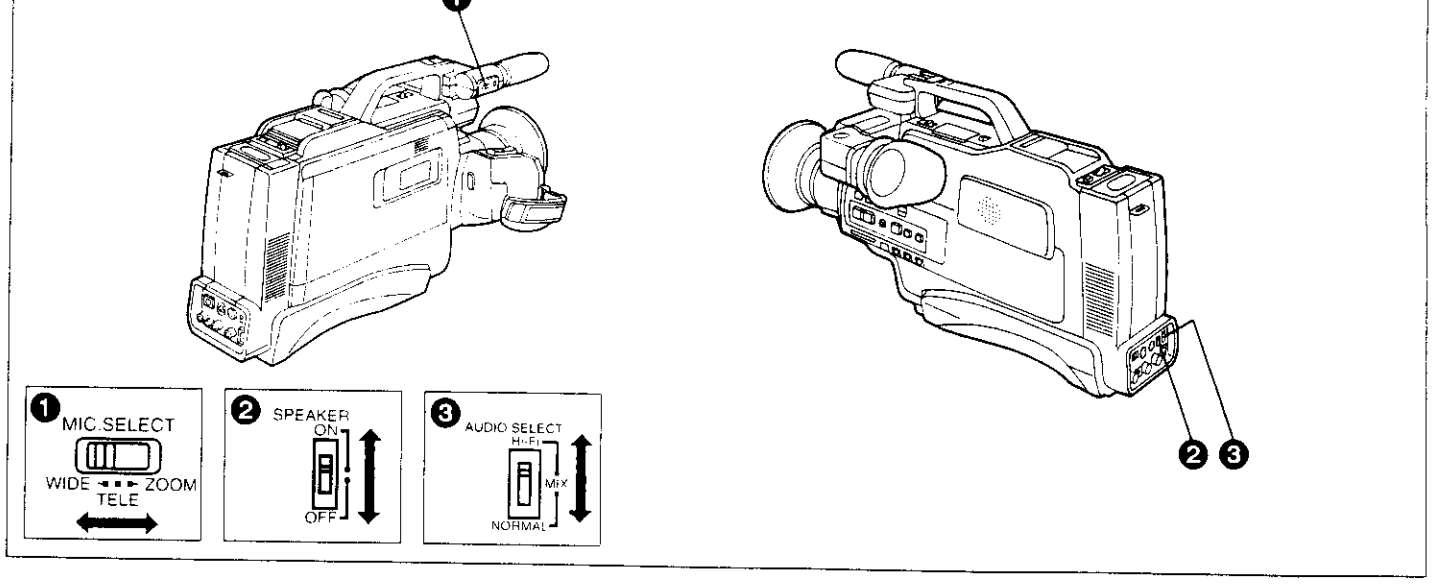
The index signals make possible the use of the VHS Index Search or the Intro Scan Function when playing back the tape on a VTR equipped with these functions.

An index signal is recorded automatically in the following cases:

- When shooting is started for the first time after attaching the Battery Pack.
- When shooting is restarted after exchanging the cassette.

In each of these cases, the "INDEX" Indication ❸ in the Viewfinder flashes for a few seconds.

- For the correct functioning of the VHS Index Search and Intro Scan Functions on the VTR, the index signals should be at intervals of not less than 2 minutes.



The Sound That Is Being Recorded

■ The Sound Recorded with the Stereo Microphone

This Movie Camera is equipped with a stereo zoom microphone. Depending on the setting of the [MIC.SELECT WIDE/TELE/ZOOM] Switch ❶, the sound will be recorded with different effect.

WIDE: The sound will be recorded with stereo effect.
TELE: The sound will be recorded with tele effect. Compared with the "WIDE" setting, the microphone directivity is stronger and the sound from distant subjects can be received louder and more distinctly.
ZOOM: The zoom control of the microphone is coupled with the Zoom Buttons. When pressing the [W] Zoom Button, the sound will be recorded with stereo effect. When pressing the [T] Zoom Button, the microphone directivity becomes stronger and the sound from distant subjects can be received louder and more distinctly.

- For normal shooting, set the [MIC.SELECT WIDE/TELE/ZOOM] Switch to "WIDE".

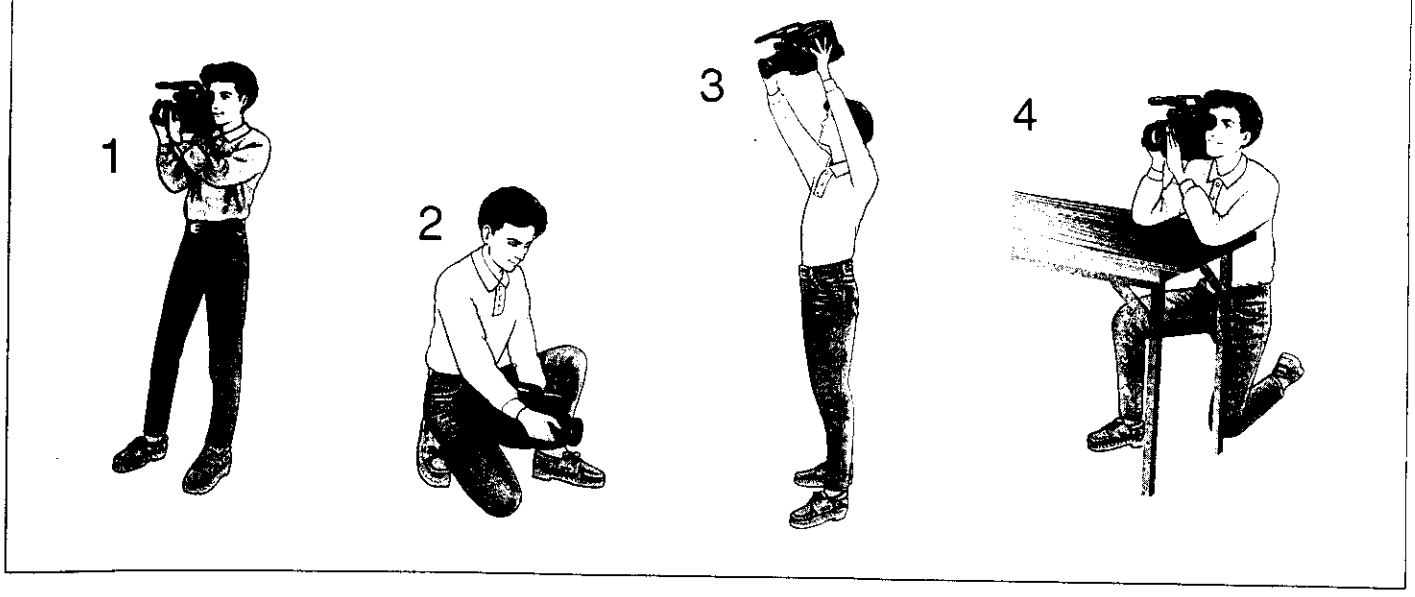
■ To Listen to the Sound during Recording or Playback

When the [SPEAKER ON/OFF] Switch ❷ is set to "ON", it is possible to listen to the sound during recording or playback. When it is set to "OFF", the sound cannot be heard.

■ The Sound Recorded with the Audio Dubbing Function

For playback, select the desired sound with the [HiFi/MIX/NORMAL] Switch ❸.

HiFi: The original sound (sound before performing audio dubbing) alone can be heard.
MIX: The original and the dubbed sound can be heard mixed together.
NORMAL: The dubbed sound alone can be heard.



Holding the Movie Camera for Shooting

1 Normal Shooting.

- When walking while shooting, keep both eyes open so that you can see where you are going and what is happening around you.
- Place the Movie Camera on your right shoulder and hold it firmly with both hands.
- Hold the Eyecup of the Viewfinder as close as possible to your right or left eye.
- Take a firm stance with the legs slightly apart.
- For stable images, it is recommended to use a tripod (optional) whenever possible. (See page 65.)

2 Low-Angle Shooting.

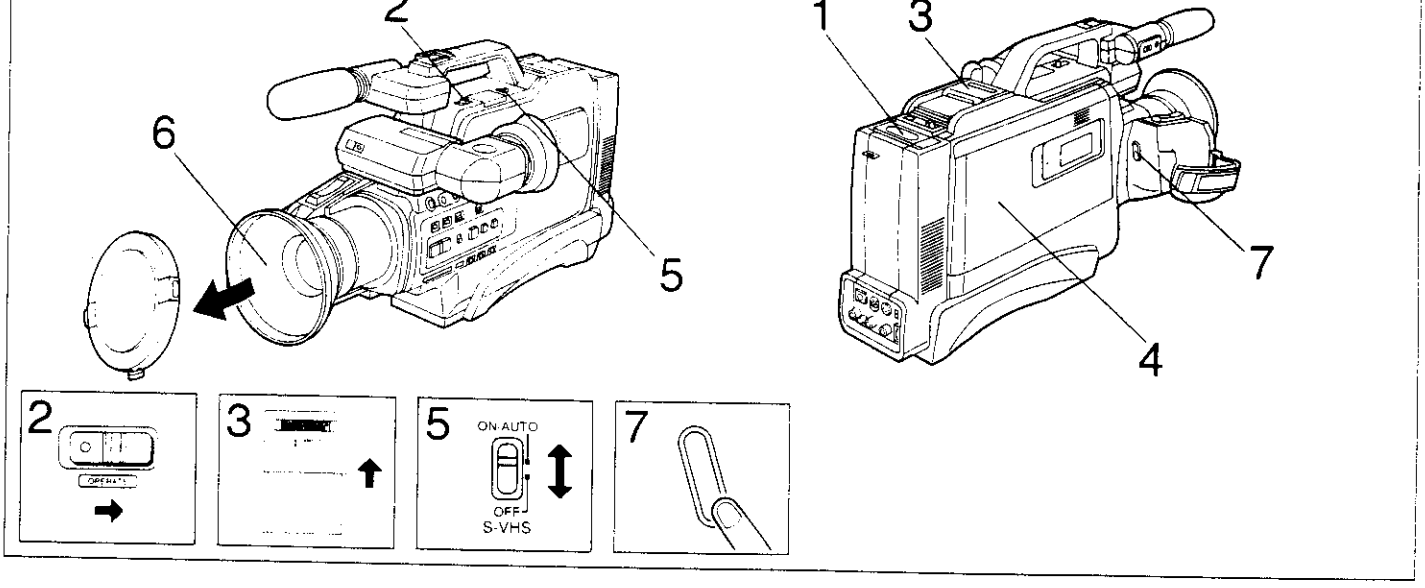
Adjust the angle of the Viewfinder according to the position in which the Movie Camera is held.

- If the Movie Camera is not held firmly in stable position, the picture in the Viewfinder cannot be watched properly.
- For easier long-angle shooting, the Start-/Stop Button on the front of the Movie Camera can be used.

3 Shooting from a high position.

4 For More Stable Pictures.

- Stabilize the Movie Camera by resting your elbows on a table or another stable horizontal surface.



Shooting

1 **Attach the charged Battery Pack.**

2 **Turn the Movie Camera on.**

3 **Slide to "CAMERA".**

4 **Insert a cassette with intact erasure prevention tab.**
- A few seconds after closing the Cassette Compartment, the Movie Camera will be in the shooting pause mode.

5 **Slide to "ON/AUTO" or "OFF".**
- In the "ON/AUTO" position, the S-VHS recording system is selected and the " S " Indication is lit. Playback will not be possible on a normal VHS VTR.
- In the "OFF" position, the " S " Indication is not lit.

6 **Remove the Lens Cap.**

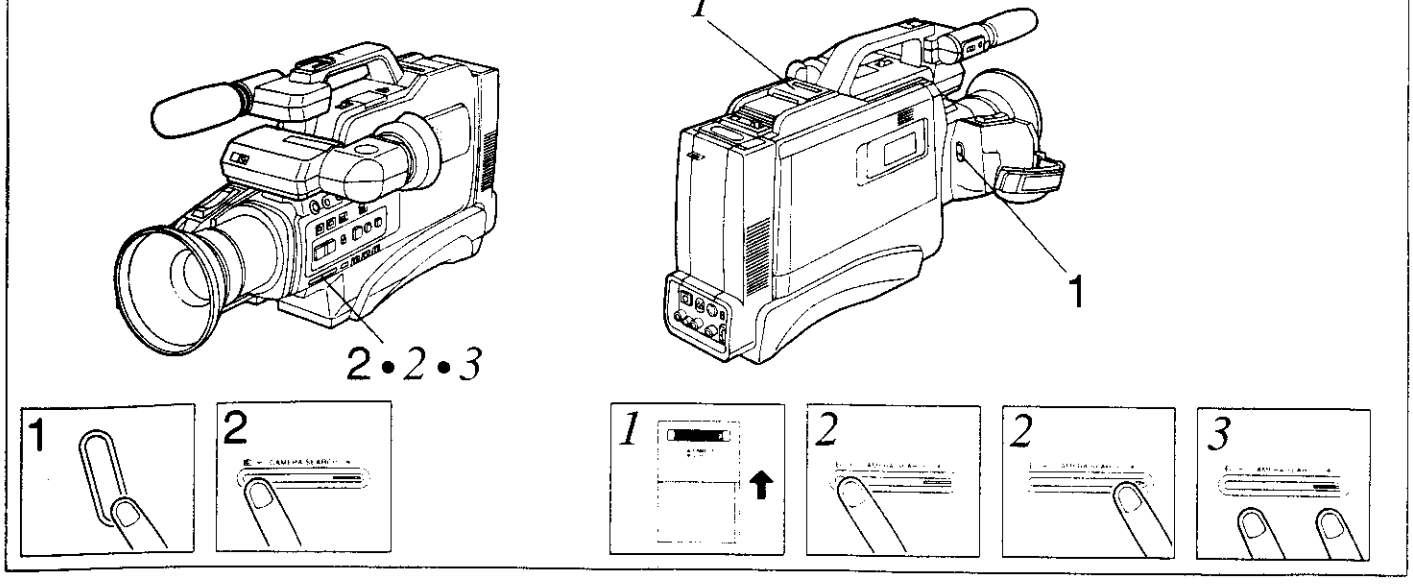
7 **Press the Start/Stop Button.**

■ **To Pause the Shooting...**
Press the Start/Stop Button.

■ **To Shoot the Next Scene(s)...**
Press the Start/Stop Button again.

■ **To Stop the Shooting...**
Press the Start/Stop Button to pause the shooting and then turn the Movie Camera off.

Note:
If the Movie Camera is left in the shooting pause mode for more than 6 minutes, the shooting pause mode will be canceled and the Viewfinder will be turned off (recording lock mode). To resume shooting from this condition, turn the Movie Camera on again. If the Movie Camera is left in the recording lock mode for more than 48 hours, it will automatically switch off completely.



Checking the Recorded Scene

1 Press to pause the shooting.
- The "PAUSE" indication appears in the Viewfinder.

2 Press briefly.
- The "CHK" indication in the Viewfinder lights up, and the last 2–3 seconds of the last recorded scene will be played back in the Viewfinder. After that, Movie Camera is again in the shooting pause mode.
("CHK" means Check.)

Note:
During shooting, use this function to confirm from time to time that the recording has been performed correctly.

Searching for a Previously Shot Scene (Camera Search)

■ How to Search for a Point in a Recorded Scene

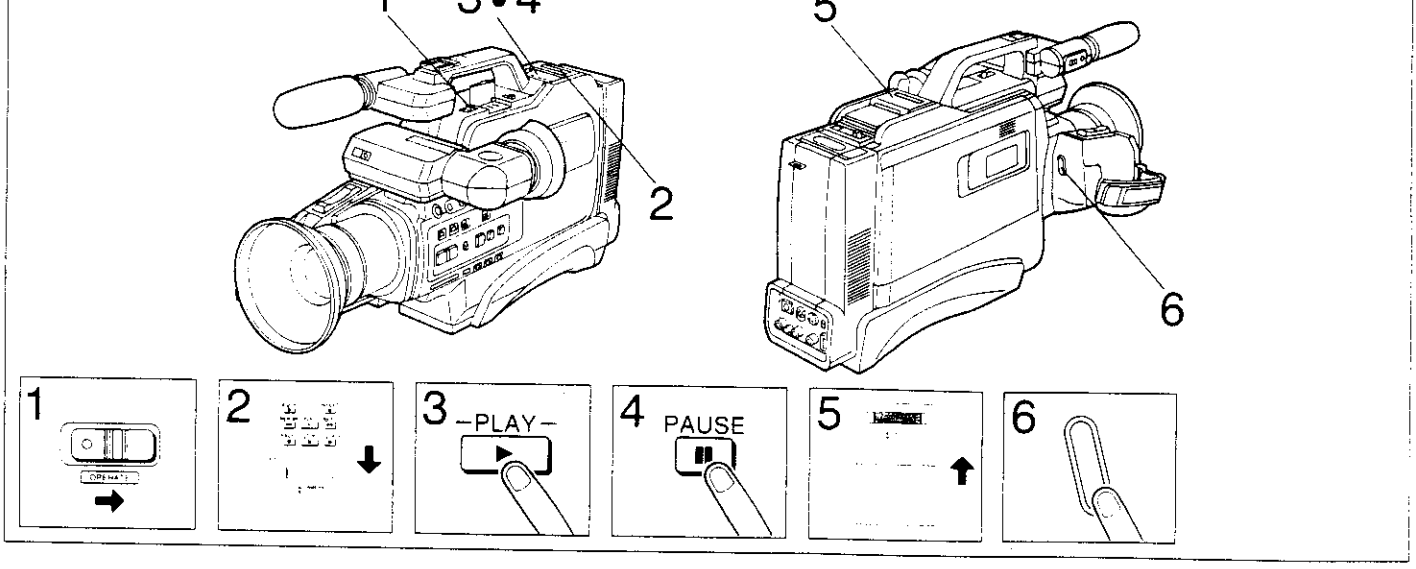
After inserting the recorded video cassette:

1 Slide to "CAMERA".

2 Keep pressed.
- While this button is kept pressed, the recorded scene will be played back at high speed in reverse direction.

Or keep pressed.
- While this button is kept pressed, the recorded scene will be played back at normal speed in forward direction.

3 Release this button after reaching the desired point.
- The Movie Camera is put into the recording pause mode.



Shooting with Clean Edits

This function makes it possible to achieve smooth transitions between a previously and a newly shot scene.

1 **Turn the Movie Camera on.**

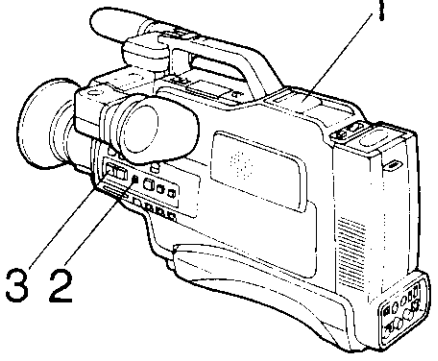
2 **Slide to "VTR".**
("VTR" means Video Tape Recorder.)

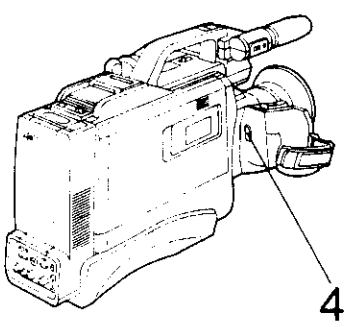
3 **Press.**

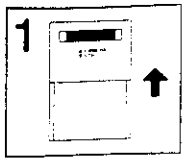
4 **Press after reaching the point where you want to add the next scene.**
(Thereby erasing the rest of the previously recorded scene.)

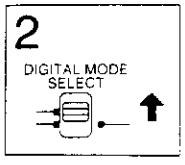
5 **Slide to "CAMERA".**

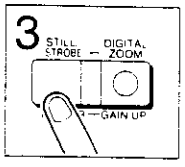
6 **Press to start shooting the new scene.**
•The shooting starts.

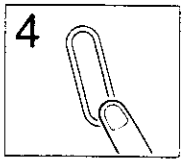












Shooting a Still Picture

For recording a Still Picture of Any Desired Duration:

1 **Slide to "CAMERA".**

2 **Slide up.**

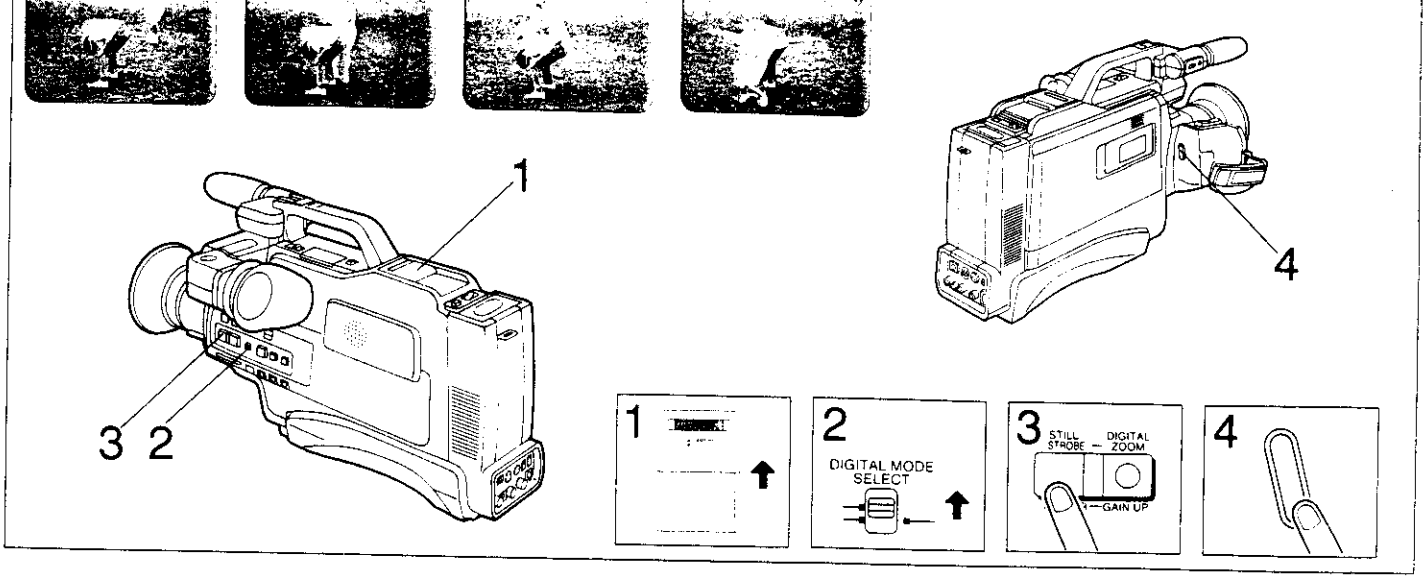
3 **Press.**
- The image in the Viewfinder stands still.
- By pressing the [STILL/STROBE] Button repeatedly, the mode can be changed in the following order:

→NORMAL→STILL→STROBE ——

4 **Press.**
- The still picture in the Viewfinder will be recorded.

■ To Cancel this Function...
Press the [STILL/STROBE] Button two times until normal movement in the Viewfinder is observed.

Hints for Shooting Still Pictures
- To prevent picture distortion, do not move or shake the Movie Camera during still picture shooting.
- Since the still picture is recorded from the digital image memory, the picture quality may be slightly inferior to that of normally recorded pictures.



Shooting with Strobe Effect

For continuously recording 6 still images per second:

1 **Slide to "CAMERA".**

2 **Slide up.**

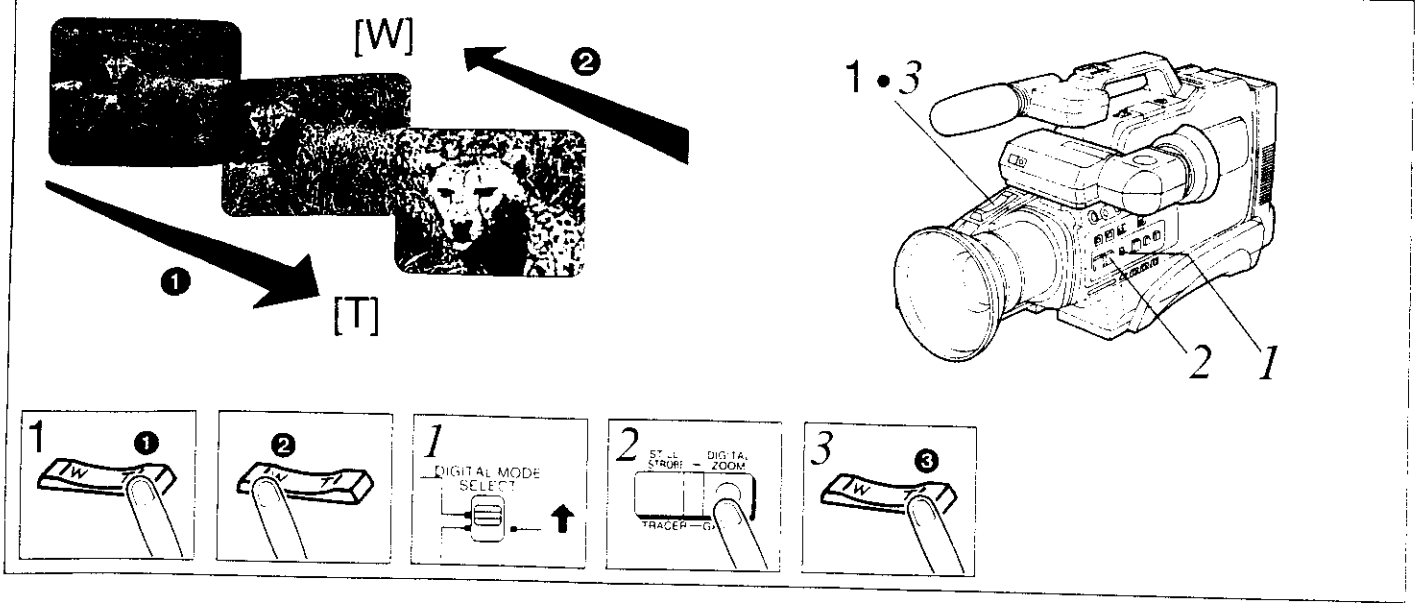
3 **Press twice.**
- The picture in the Viewfinder will also have a strobe effect.

4 **Press.**
- Continuous shooting with strobe effect is now possible.

■ **To Cancel this Funciton...**
Press the [STILL/STROBE] Button until normal movement in the Viewfinder is observed.

Hints for Shooting Pictures with Strobe Effect
By combining the Strobe Function with the High-Speed Shutter, the strobe effect can be increased. (For outdoor shooting, the 1/250-second shutter speed is recommended.)
(See page 37.)

Notes:
- When shooting under fluorescent lamps, the brightness of the picture may fluctuate.
- Since the strobe pictures are recorded from the digital image memory, the picture quality may be slightly inferior to that of normally recorded pictures.



Shooting with the Zoom Function

■ Using the Power Zoom Function

To make your zoom shots more impressive and to achieve exactly the desired effect, do it like the professionals: before actually shooting, make a trial run of the zooming.

1 Keep pressed for telephoto.
Zoom in (subject appears closer ❶)
Keep pressed for wide-angle.
Zoom out (subject appears further away ❷)

■ Using the Digital Zoom Function

The Digital Zoom Function makes it possible to zoom in on a subject and enlarge it by up to 100 times by using the [T] Zoom Button and the [DIGITAL ZOOM] Button.

1 Slide up.

2 Press.

- At one press, the "D.ZOOM 1" Indication appears in the Viewfinder; at a second press, the "D.ZOOM 2" Indication appears.

3 Press ❸.

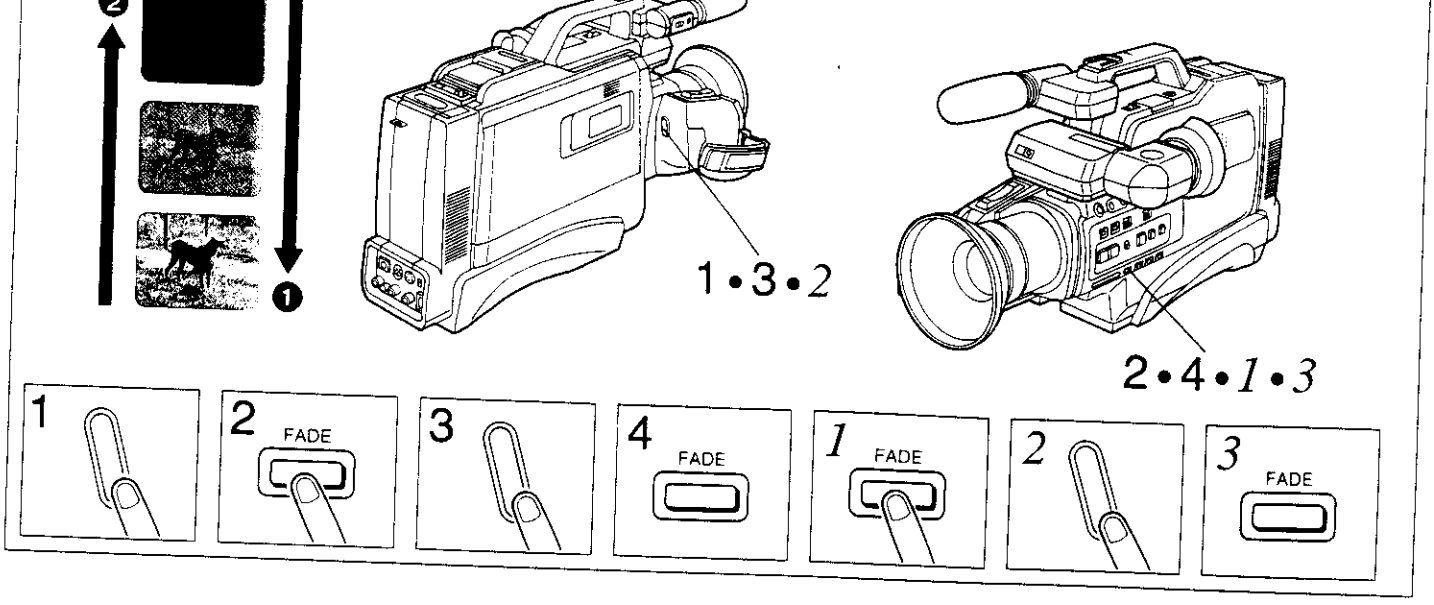
■ To Cancel this Function...

Press the [DIGITAL ZOOM] Button.

- When the Digital Zoom Function is turned off, the zoom range is limited to ×12.
- When the Digital Zoom Function is activated, the picture is magnified electronically and the zoom range is increased to ×24 (D.ZOOM 1) and ×100 (D.ZOOM 2).
- The Digital Zoom Function slightly decreases the picture resolution and fine picture details.
- When shooting under very bright conditions, the after-image can be eliminated by selecting a shutter speed of 1/250 or 1/500 sec.

Note:

The higher the magnification of the Digital Zoom becomes, the grainier the picture will be. When the zoom range is increased to ×100, the picture and its colours may become unnatural.



Shooting with the Fade Function

■ How to Fade in ❶

Fading in from black is very effective at the beginning of a movie and for soft transitions between scenes.

1 **Press to pause the shooting.**

2 **Keep pressed.**

3 **Afte the picture in the Viewfinder has disappeared, press to start the shooting.**

4 **After about 3 seconds, release the button.**

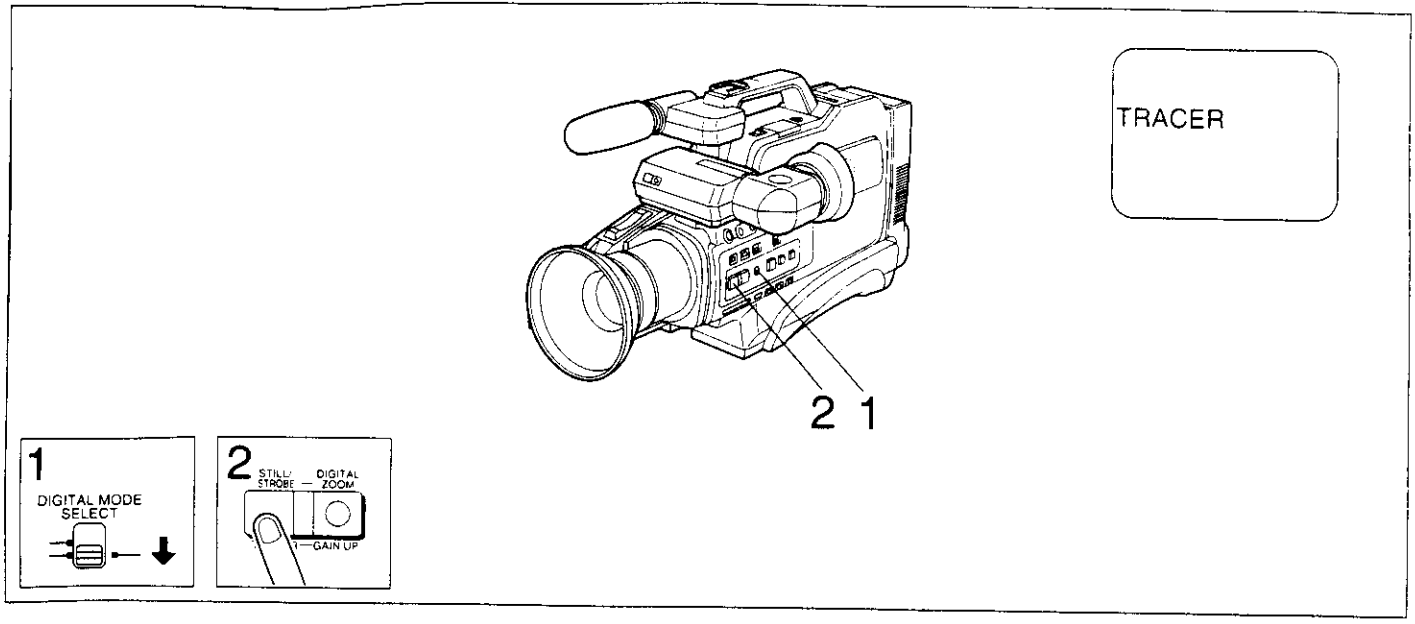
■ How to Fade out ❷

Fading out to black is convenient at the end of a scene to create a soft ending.

1 **Keep pressed during shooting.**

2 **After the picture has disappeared, press to stop the shooting.**

3 **Release the button.**



Shooting with the After-Image Effect (Tracer Function)

This function can be used to emphasize the speed of movements in fast-action scenes.

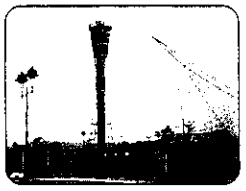
1 Slide the Digital Mode Select Switch to downward.

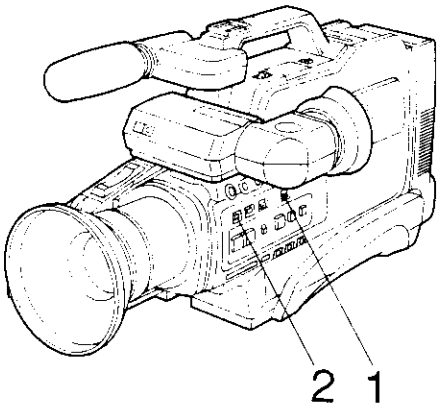
2 Press the "TRACER" Button.

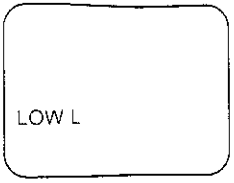
- The "TRACER" Indication appears.

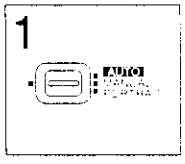
■ To cancel this function...

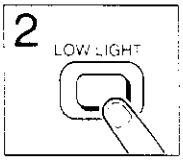
Press the "TRACER" Button again or slide the Digital Mode Select Switch to upward.











Shooting Sunsets or Other Evening Scenes (Low Light Function)

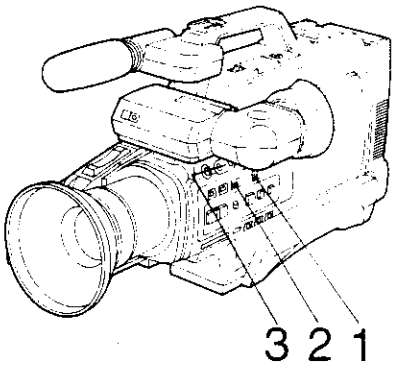
1 Set to "MANUAL".

2 Press.

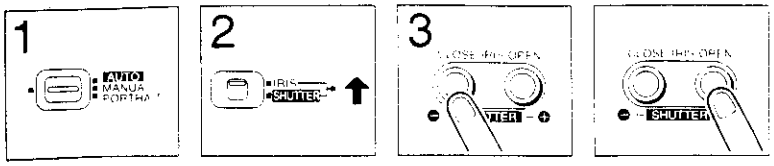
- The "LOW L" Indication appears.
- This increases the sensitivity compared to the "AUTO" setting of the Mode Selector Switch and assures stable images with relatively weak contrast.

Note:

- Even if this mode is used for outdoor shooting in the daytime, the result will be almost the same as when the Mode Selector Switch is set to "AUTO".
- In the Portrait Mode, the Lowlight Function is activated. (See page 58.)



F2.4



Shooting Backlit Scenes

(Iris Adjustment)

This function makes it possible to brighten up the subject when shooting a backlit scene.

1 Set the Mode Selector Switch to "MANUAL".

2 Set to "IRIS".

3 Press repeatedly the either button to select the desired F Number.

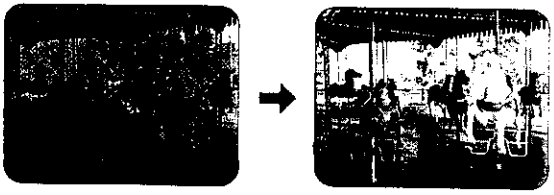
- The F Number Indication appears.
- The F Number can be changed in 18 steps:
  OP+G1, OP+G2, OPEN, F2, F2.4, F2.8, F3.4, F4, F4.8, F5.6, F6.8, F8, F9.6, F11, F14, F16, F19, CLOSE

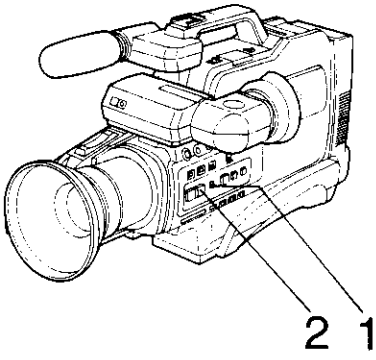
■ To Return to the Standard Iris Setting...

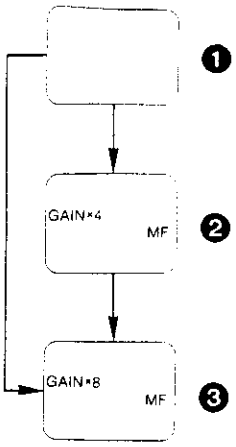
- Press the [OPEN +] Button and [CLOSE −] Button simultaneously for more than 1 second.
- Returning to the standard iris setting is also possible by setting the Mode Selector Switch to "AUTO".

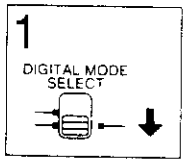
Cautions for Shooting Backlit Subjects

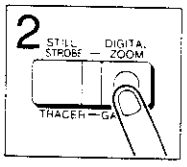
- The sky may become whitish.
- In case of extremely strong backlight, is may not be possible to brighten up the subject sufficiently.
- When shooting with the sun striking the subject at an angle, star-shaped light reflexes may be recorded in the picture.











Shooting in the Dark

(High Sensitivity Function)

1 Slide down.

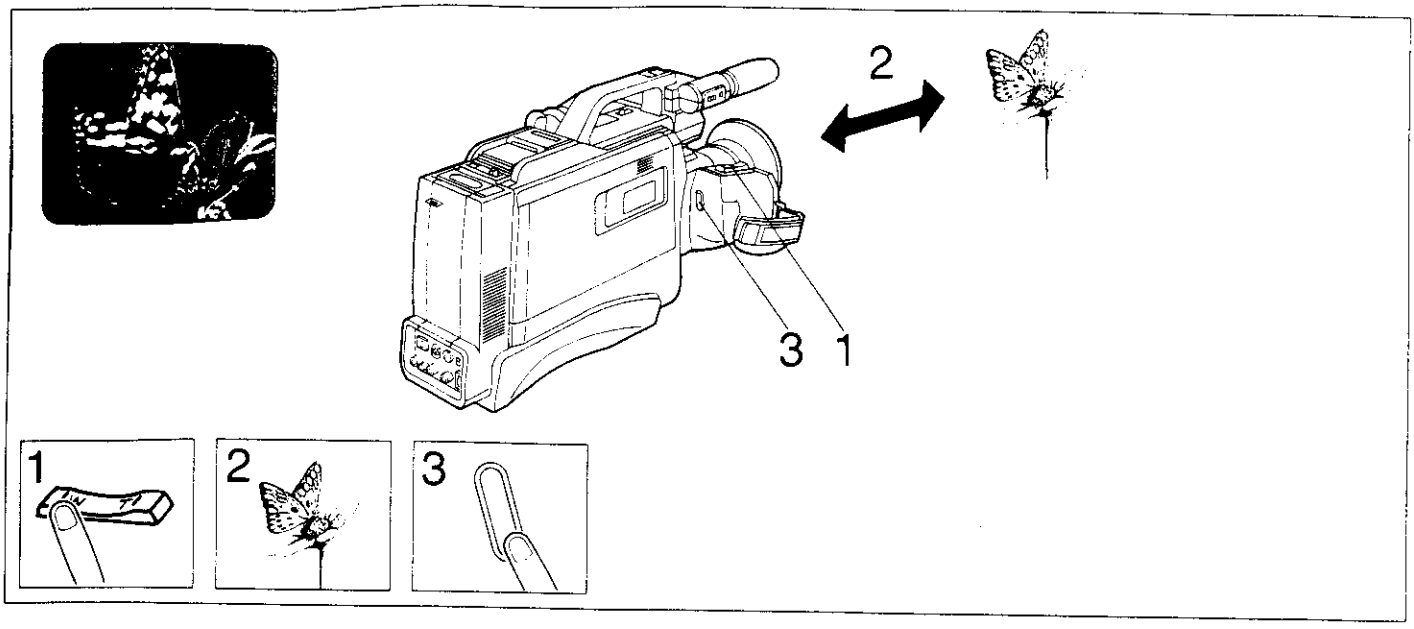
2 Press.

- By pressing the [GAIN UP] Button repeatedly, the degree of the sensitivity can be changed as follows:

No indication → GAIN ×4 → GAIN ×8
❶ ❷ ❸

Notes:

- Some after-image distortion will occur.
- When the High Sensitivity Function is activated, no other Digital Mode Function can be used.
- The High-Speed Shutter Function will be be cancelled automatically.
- In the High-Sensitivity Mode, the focus must be adjusted manually since the Movie Camera is automatically put into the Manual Focus Mode.



Shooting with the Macro Function

The Macro Close-up Function makes it possible to shoot very small objects, photos, printed matter, insects and many other things.

1 Keep pressed to zoom to the maximum wide-angle position.

2 Approach the subject to the desired distance.

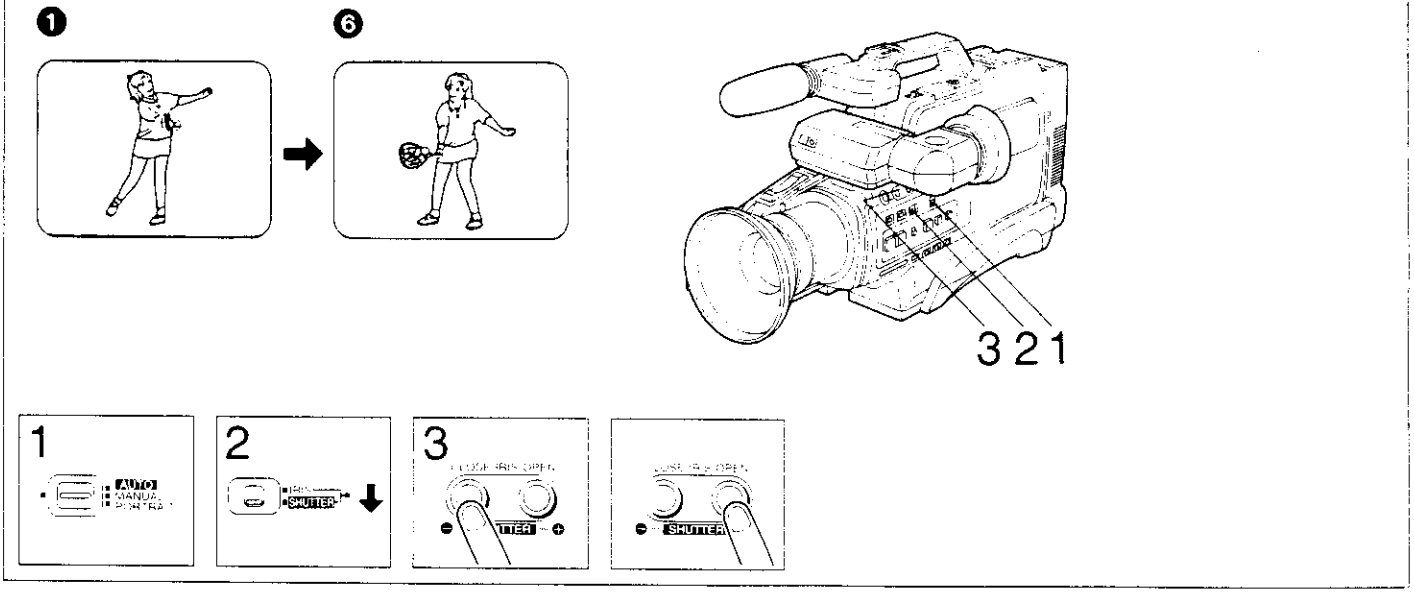
- The focus will be adjusted automatically (Auto Focus Mode).

3 Press.

- The shooting starts.

Hints for Shooting with the Macro Close-up Function

- To get more or less of the subject into the picture, change the distance between the lens and the subject; do not use the [W] or [T] Zoom Button.
- As the depth of field is very small in macro shooting, even slight camera movements can cause the subject to go out of focus. Therefore, it is recommended to use a tripod (optional).
- When shooting pictures in a photo album or a similar situation with insufficient lighting, use a Video DC Light.
- Whe the zoom lens is in its maximum telephoto position, the minimum shooting distance between lens and subject is 1 m.
- In macro close-up shooting, the subject can be approached down to a minimum distance of 5 mm between lens and subject. It is recommmended to use the Auto Focus Mode. However, with a stable camera position (tripod, etc.), the Manual Focus Mode can also be used.



Shooting Fast-Moving Subjects

(High-Speed Shutter Function)

A range of different high shutter speeds makes it possible to shoot scenes with fast movements. When scenes recorded with a high shutter speed are later played back on a VTR equipped with super still and super fine slow motion functions, still and slow motion playback with very sharp picture contours and brilliant details can be obtained.

1 Set to "MANUAL".

2 Set to "SHUTTER".

3 Press repeatedly either Button to select the desired shutter speed.

- The shutter speed can be changed in 8 steps:

Pressing the [OPEN +] Button ——————————►

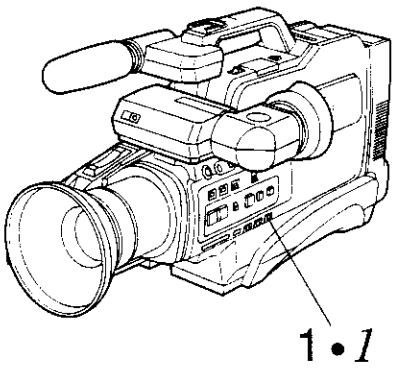
❶	❷	❸	❹	❺	❻	❼	❽
1/50	1/120	1/250	1/500	1/1000	1/2000	1/4000	1/8000

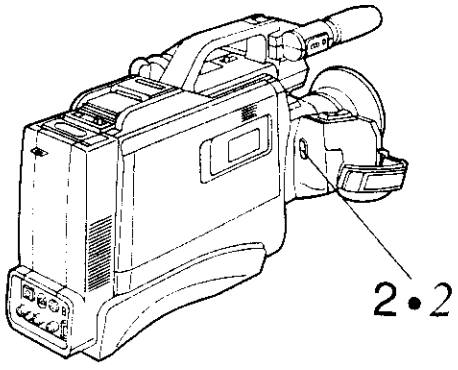
(No indication)
Normal

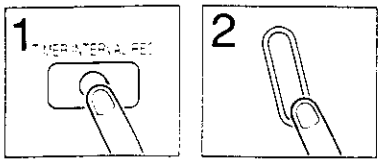
◄—————————— Pressing the [CLOSE −] Button

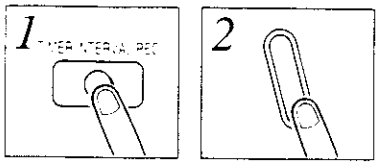
Conditions for Shooting with the High-Speed Shutter

- The subject must be brightly lit by sunlight or other strong illumination, with little shade.
- When shooting under fluorescent lamps, the picture will be adversely influenced by flickering.
- When the picture is played back in the normal playback mode, the picture movement may not be as smooth as normally.
- The playback picture will be slightly darker than the picture recorded without using the High-Spped Shutter Function.









Self-Timer Recording and Interval Recording

■ Self-Timer Recording

1 Press during recording pause to select the desired recording mode.

- When the Timer/Interval Recording Button is pressed once, "SLF20" will appear in the EVF, and when the button is pressed, "SLF" will appear in the EVF.

2 Press.

- The self-timer recording will start 10 seconds later.
- When "SLF20" is indicated, the recording will be made for 20 seconds.
  When "SLF" is indicated, the recording will be made until the tape reaches its end.

To stop the Self-Timer Recording Midway
Press the Start/Stop Button, and the self-timer recording will be cancelled.

■ Interval Recording

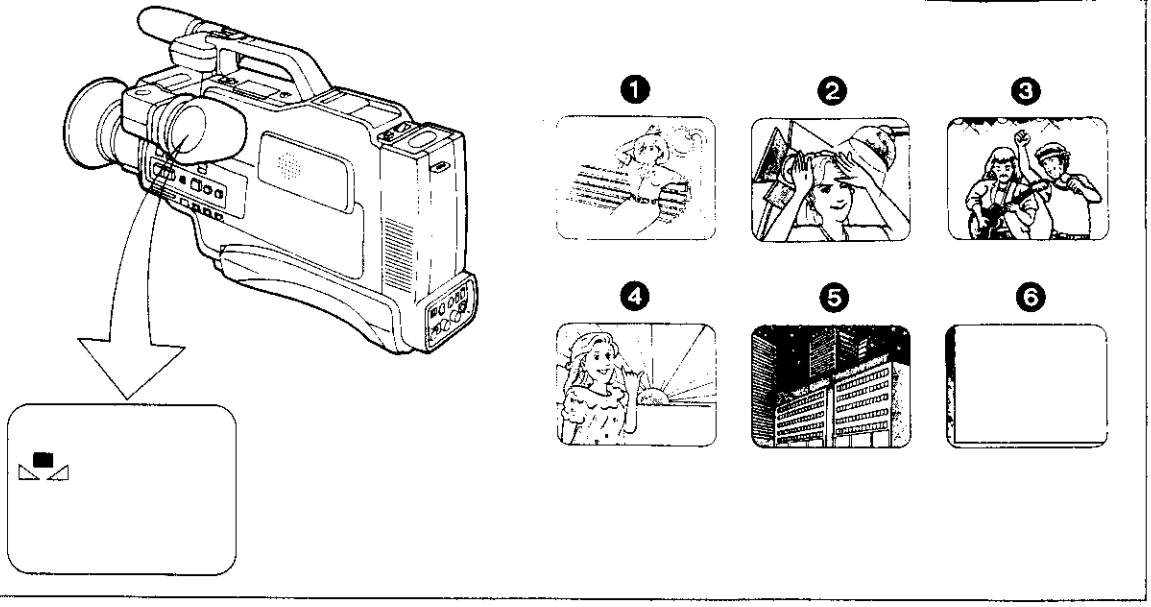
This recording function automatically makes recordings of approx. 1 second duration at 1-minute intervals. (However, the initial recording will last for about 5 seconds.) The interval recording will continue for a maximum of 10 hours, after which the Movie Camera will turn itself off.

1 Press three times during recording pause mode.

- "INT" will appear in the EVF.

2 Press.

To stop the Interval Recording Midway
Press the Start/Stop Button, and the interval recording will be cancelled.



Automatic White Balance Adjustment

To human eyes, white subjects appear as white even under different lighting conditions. A Movie Camera, however, would give these white subjects, depending on the colour of the light source, a reddish or bluish tint. To attain recordings with natural colours, it is necessary to adjust the sensor in the camera to the existing colour of the light. This adjustment is called white balance adjustment. This camera offers two modes for this adjustment: Automatic and Manual White Balance Adjustment.
The Automatic White Balance Adjustment Function provides satisfactory results with almost all subjects. (No operation is necessary.)

When the " " Indication is displayed in the Viewfinder, the Movie Camera is not in the Auto White Balance Mode. In this case, press the [W.B] Button to make the " " Indication disappear.

- If the Movie Camera is moved from outdoors to indoors during shooting, the picture will initially take on a slightly reddish cast but it will gradually regain its natural colours.
- In the following shooting situations, the Auto White Balance Adjustment Mode may not provide satisfactory results; use the Manual White Balance Adjustment Mode instead:

❶ When shooting under mercury-vapor, natrium or some types of fluorescent lamps.

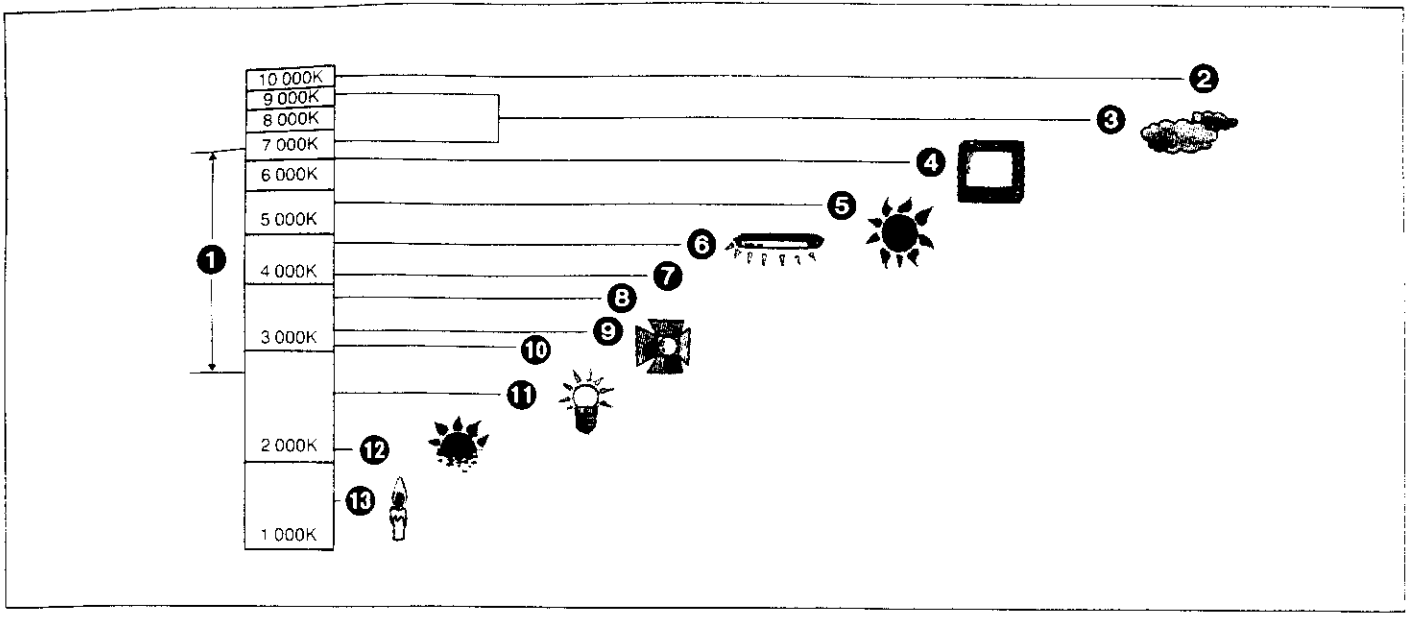
❷ When intense lighting is used, e.g. from a halogen lamp, or when the colour temperature of the light source is low.

❸ When shooting under lighting conditions which change suddenly.

❹ When shooting outdoors at sunrise or sunset.

❺ When shooting under firework illumination at night outdoors.

❻ When shooting a subject or background of a single colour.



Automatic White Balance Adjustment (Cont'd)

■ What is the Colour Temperature of the Light Source

The colour temperature of the light source is measured in Kelvin (K). The higher the Kelvin value is, the more bluish the light is; the lower the value, the more reddish the light is. This is not directly related to the brightness.

❶ Control range of the Auto White Balance

❷ Blue sky

❸ Cloudy sky

❹ TV screen

❺ Sunlight

❻ White fluirescent light

❼ 2 hours after sunrise or before sunset

❽ 1 hour after sunrise or before sunset

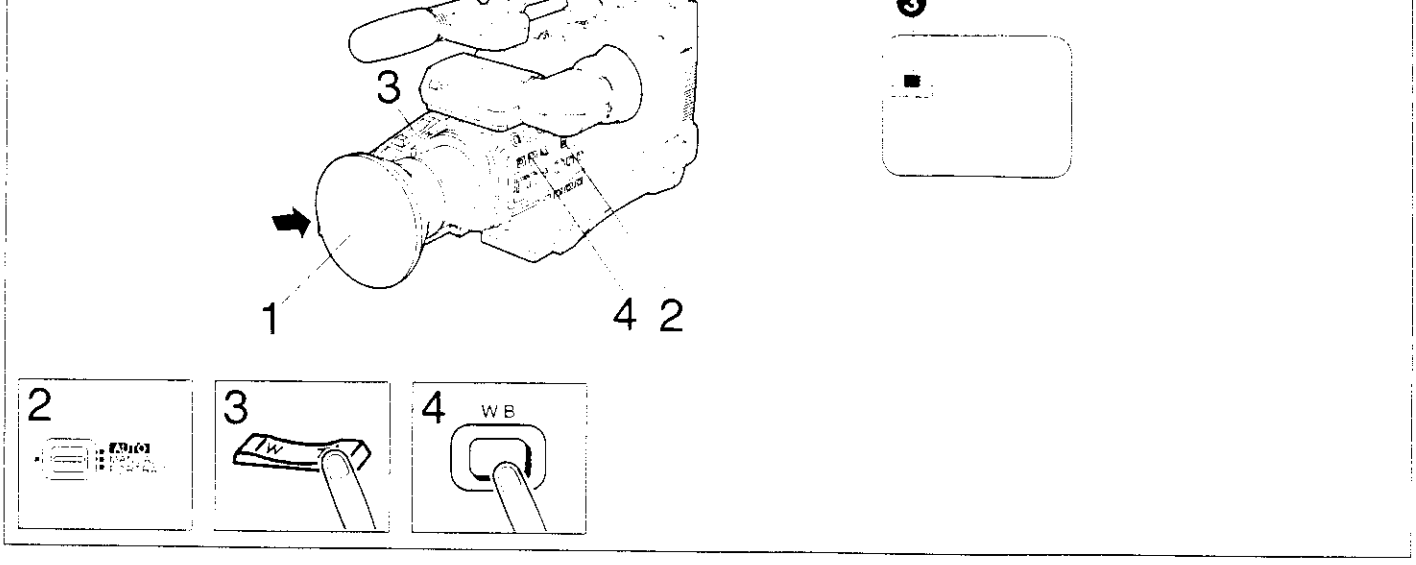
❾ Halogen light bulb

❿ 30 minutes after sunrise or before sunset

⓫ Incandescent electric light bulb

⓬ Sunrise or sunset

⓭ Candlelight



Manual White Balance Adjustment

■ **If there is only one light source:**

1 **Attach the Lens Cap to the Lens.**

2 **Set to "MANUAL".**

3 **Keep pressed until the screen in the Viewfinder becomes completely white.**

4 **Keep pressed for more than 1 second.**
The following indications in the Viewfinder inform about the state of the adjustment:

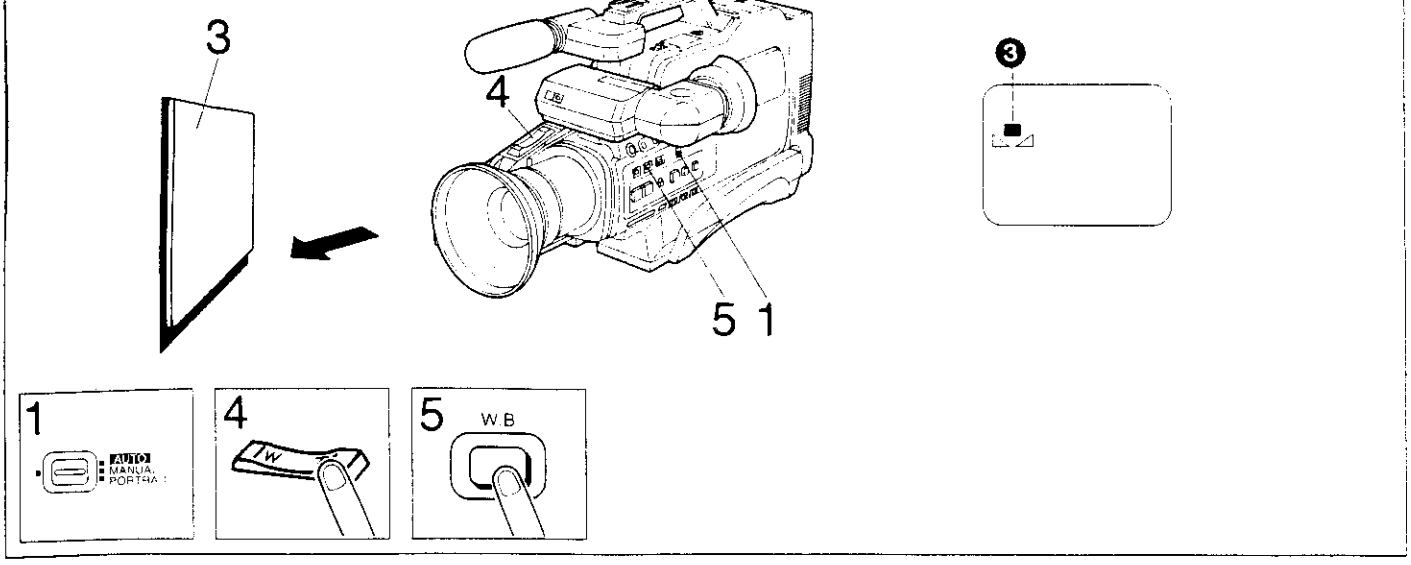
❶ " ■ " flashes slowly . . . . . Not adjusted

❷ " ■ " flashes rapidly . . . . . During adjustment

❸ " ■ " is lit . . . . . Adjustment is finished
The Movie Camera is now ready for shooting.

■ **Automatic Recall of the Previous White Balance Setting**

- After turning the Movie Camera off and later on again, the " ■ " indication flashes slowly, however, the last previous white balance setting is still maintained.
  However, to ensure the best possible colour reproduction, adjust the white balance again.
  The last previous white balance setting is also maintained after pressing the [– CAMERA SEARCH] Button to confirm the end of the previously recorded scene.
  But after removing the Battery Pack (or disconnecting the AC Adaptor from the Movie Camera) the last previous white balance setting is no longer maintained.
- When moving the Movie Camera from indoor to outdoor or vice versa, be sure to adjust the white balance, as the colour of the light has changed considerably.



Manual White Balance Adjustment (cont'd)

■ **If there are several light sources or if the illumination is weak (indoors, etc.):**

1 **Set to "MANUAL".**

2 **Remove the Lens Cap.**

3 **Point the Movie Camera at white paper or at another purely white object.**

4 **Keep pressed until the screen in the Viewfinder becomes completely white.**

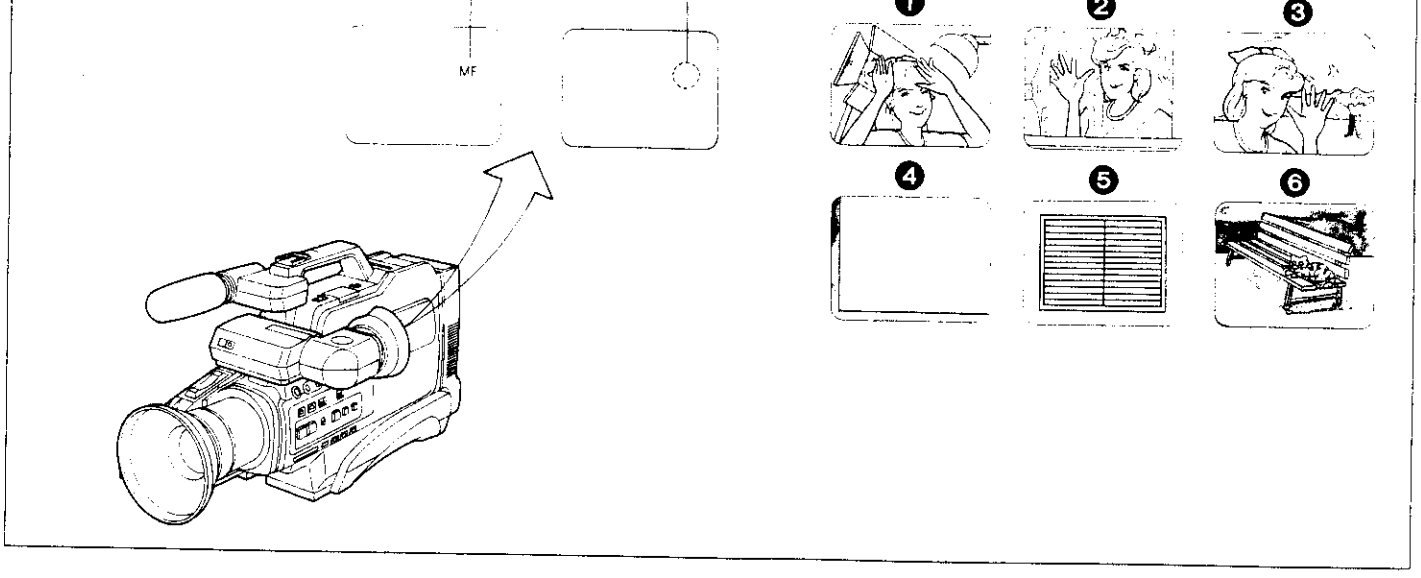
5 **Keep pressed for more than 1 second.**
The following indications in the Viewfinder inform about the state of the adjustment:

❶ " ⊾■◿ " flashes slowly . . . . . .Not adjusted

❷ " ⊾■◿ " flashes rapidly . . . . . .During adjustment

❸ " ⊾■◿ " is lit . . . . . .Adjustment is finished
The Movie Camera is now ready for shooting.

■ **To Change Back to the Auto White Balance Adjustment Mode...**
Press the [W.B] Button briefly. The " ⊾■◿ " Indication in the Viewfinder disappears.



Automatic Focus Function

■ No operation is necessary

This Movie Camera focuses automatically on almost all subjects.

When the "MF" indication ❶ is not displayed in the Viewfinder, the Movie Camera is in the auto focus mode. ("MF" means Manual Focus)

- The focus will automatically be adjusted to the subject in the centre of the Viewfinder.

■ When the "MF" Indication is displayed in the Viewfinder ❶...

Press the [FOCUS] Button or set the Shooting Mode Selector switch to "AUTO" to activate the Auto Focus Mode.

- The "MF" Indication in the Viewfinder disappears ❷.

In the following shooting situations, the Auto Focus Mode may not provide satisfactory results; use the Manual Focus Mode instead.

❶ Shiny surfaces. Subjects with backlighting or much light reflection.

❷ A subject behind dirty glass.

❸ A subject with a part of it near the Movie Camera and another part far away from it.

❹ A flat surface, e.g. a white wall.

❺ A subject with horizontal stripes.

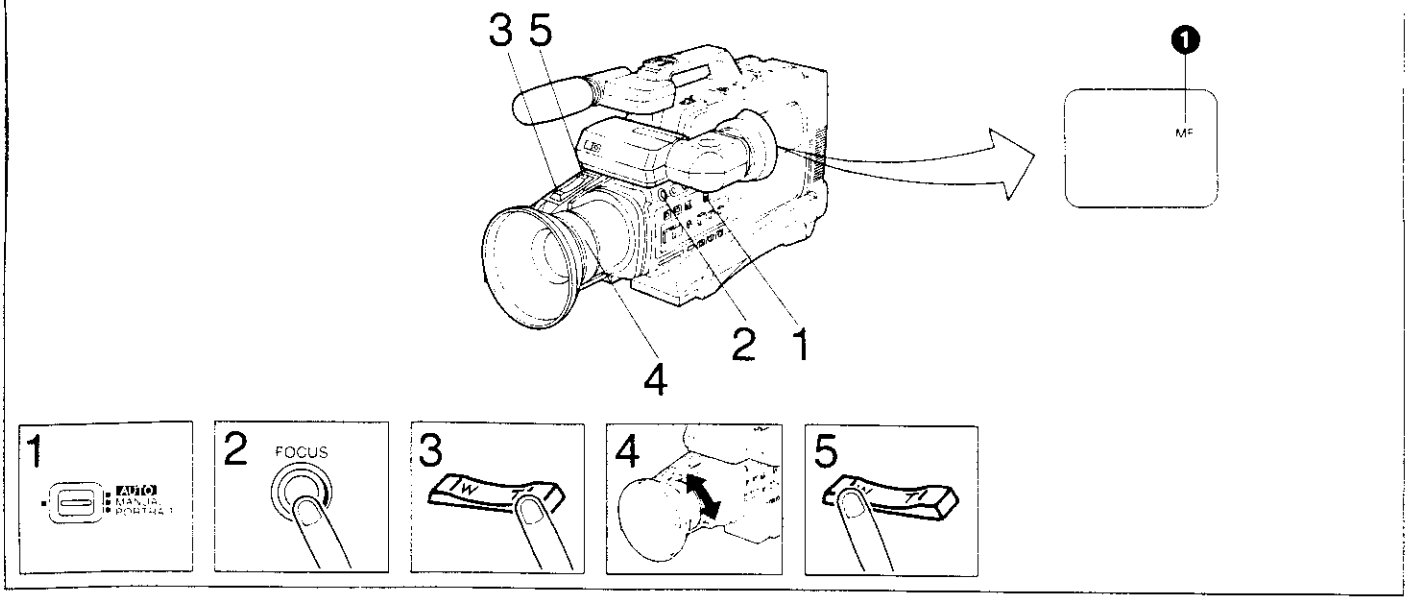
❻ An oblique subject.

Others:

—A fast-moving subject.
—A subject with a dark surface.
—When using the Macro Close-up Function, special lenses, etc.

Note:

When zooming from wide-angle toward telephoto, the subject may slightly go out of focus depending on the shooting conditions.



Manual Focus Function

1 Set the Mode Selector Switch to "MANUAL".

2 Press.
- The "MF" Indication appears in the Viewfinder ❶.

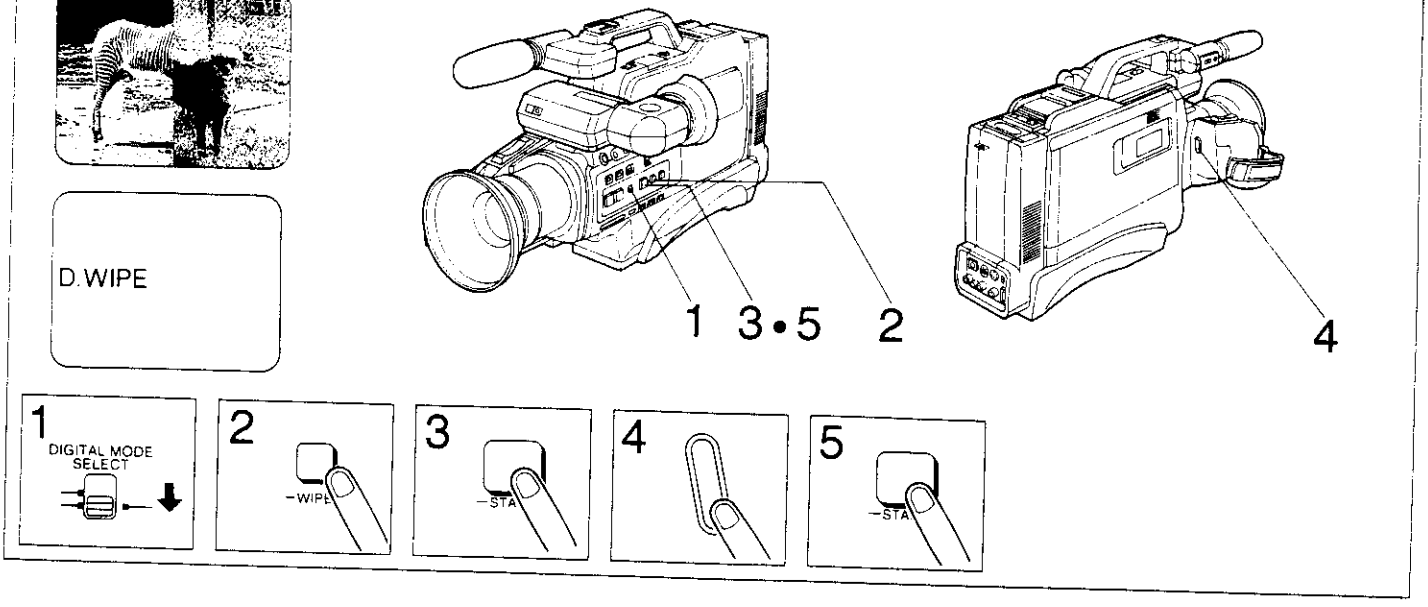
3 Press to zoom in on the subject to be focused.

4 Turn the Focus Ring to adjust the focus.

5 Press to zoom back as desired.

■ To Change back to the Auto Focus Mode...
Press the [FOCUS] Button or set the Shooting Mode Selector Switch to "AUTO".
- The "MF" Indication disappears in the Viewfinder.

Note:
When using the Manual Focus Mode, always adjust the lens with the Zoom [T] Button in the maximum tele setting.
This will ensure that the subject remains precisely focused throughout the zoom range from the maximum tele to maximum wide-angle setting.



Inserting a Still Picture with Wipe Editing (Digital Wipe)

■ Inputting a Still Picture into the Memory

When the Movie Camera is in the shooting pause mode:

1 Slide down.

2 Press.

- Press this button while aiming the Movie Camera at the scene to be used for the still picture.
- The image in the Viewfinder stands still for approx. 2 seconds and this still picture is input into memory.

■ Starting to Shoot a Scene with the Still Picture

In the shooting pause mode:

3 Press.

- The still picture from the memory replaces the moving picture gradually, starting from the left side.
- The Movie Camera should be aimed at the scene, which is to be shot following the recording of the still picture.

4 Press.

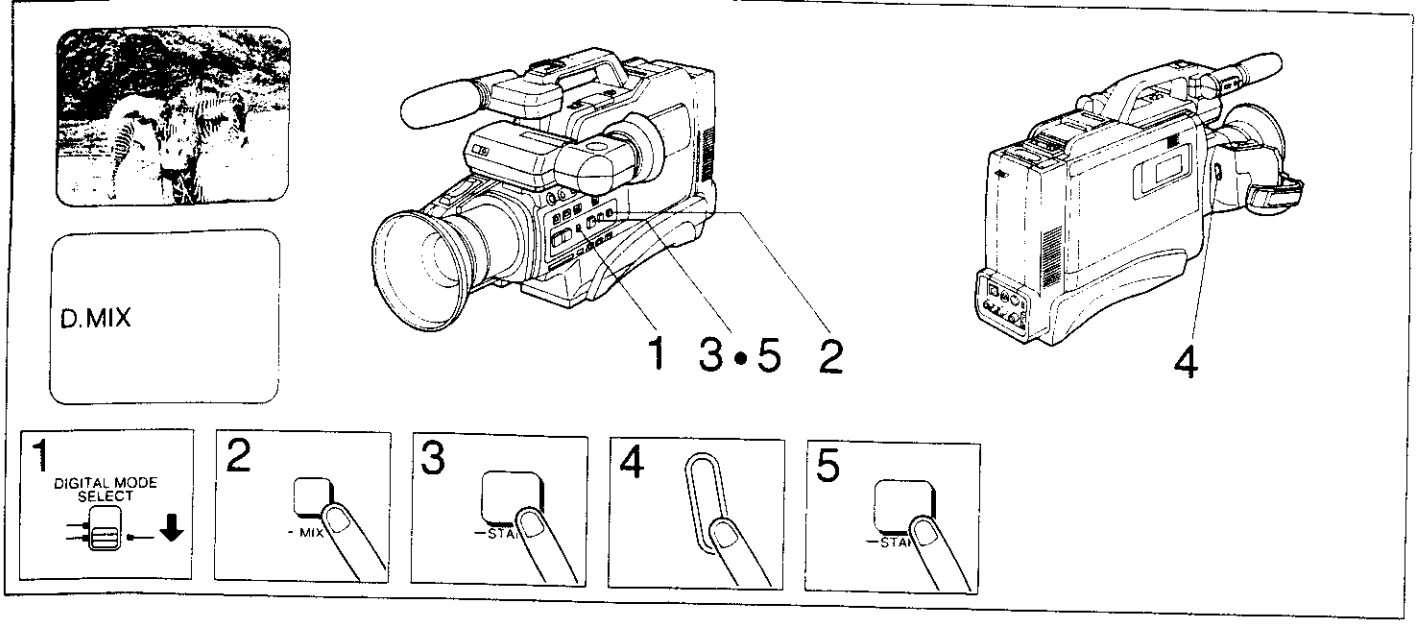
- The still picture from the memory is now being recorded.

5 Press again.

- The moving picture again replaces the still picture gradually, starting from the right side, and the shooting of the moving picture continues.

■ Canceling the Digital Wipe Function

Slide the Digital Mode Selector Switch up.



Fading Over or Superimposing a Still Picture onto the Moving Picture (Digital Image Mix)

■ Inputting a Still Picture into Memory

When the Movie Camera is in the shooting pause mode:

1 Slide down.

2 Press.

- Press this button while aiming the Movie Camera at the scene to be used for the still picture.
- The image in the Viewfinder stands still for approx. 2 seconds and this still picture is input into memory.

■ Starting to Shoot a Scene with the Still Picture

In the shooting pause mode:

3 Press.

- The still picture from the memory replaces the moving picture gradually.
- If this button is pressed for 2 seconds, the still picture appears superimposed onto the moving picture.
- The Movie Camera should be aimed at the scene, which is to be shot following the recording of the still picture.

4 Press.

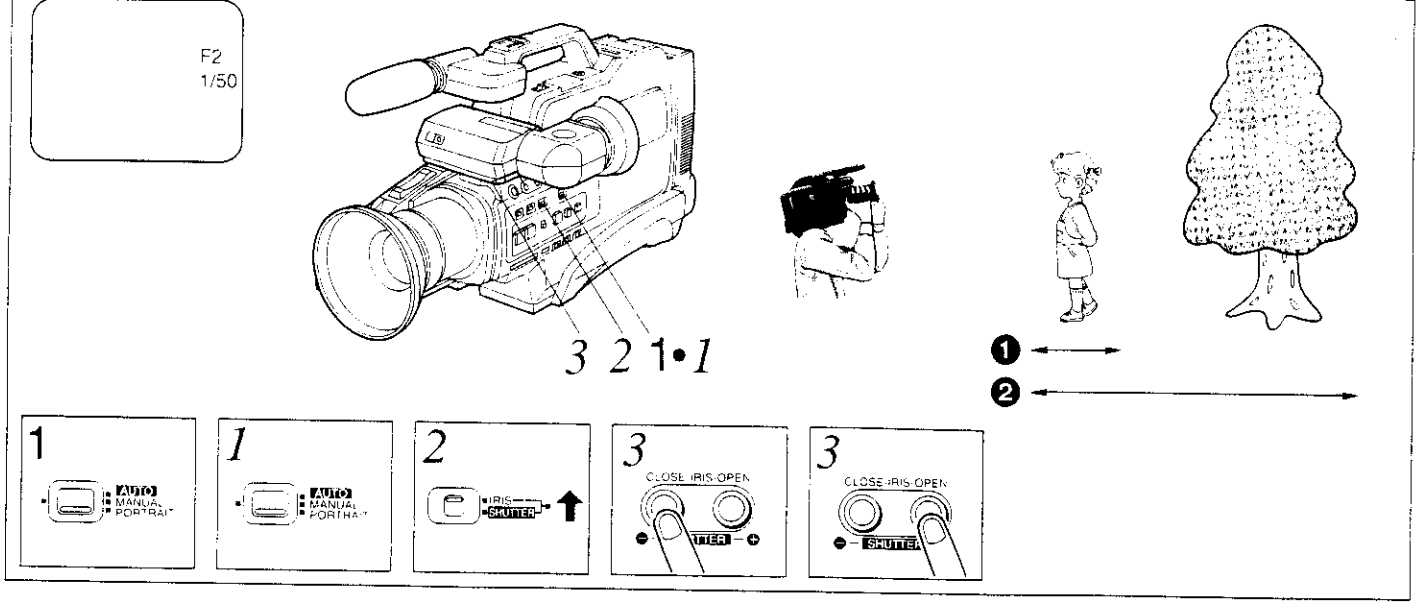
- The still picture from the memory is now being recorded.

5 Press again.

- The moving picture again replaces the still picture gradually, and the shooting of the moving picture continues.
- If the [MIX] Button was pressed for 2 seconds to superimpose the still picture, the superimposed still picture will disappear, and the shooting of the moving picture alone continues.

■ Cancelling the Digital Mix Function

Slide the Digital Mode Selector Switch up.



Shooting a Portrait (Portrait Mode)

This function makes it possible to shoot a portrait with the face perfectly focused and the background blurred.

1 Set to "PORTRAIT".

- The F Number Indication "OPEN" and Shutter Speed Indication appear.

■ To Cancel this Function...
Set the Mode Selector Switch to "AUTO".

■ Iris Priority Mode

Any of 15 F Number settings between "OPEN" and "F19" can be selected. The optimum shutter speed (between 1/50 and 1/1000 sec.) will automatically be selected according to the brightness of the subject and the selected F Number.

By setting the iris to or near the "OPEN" position, it is possible to shoot a portrait with the person perfectly focused and the background blurred.

- Opening the iris reduces the depth of field, i.e. the distance range within which the subject is sharp becomes smaller.
- Closing the iris increases the depth of field, i.e. the distance range within which the subject is sharp becomes larger.

❶ Depth of field with iris turned toward "OPEN"

❷ Depth of field with iris turned toward "F19"

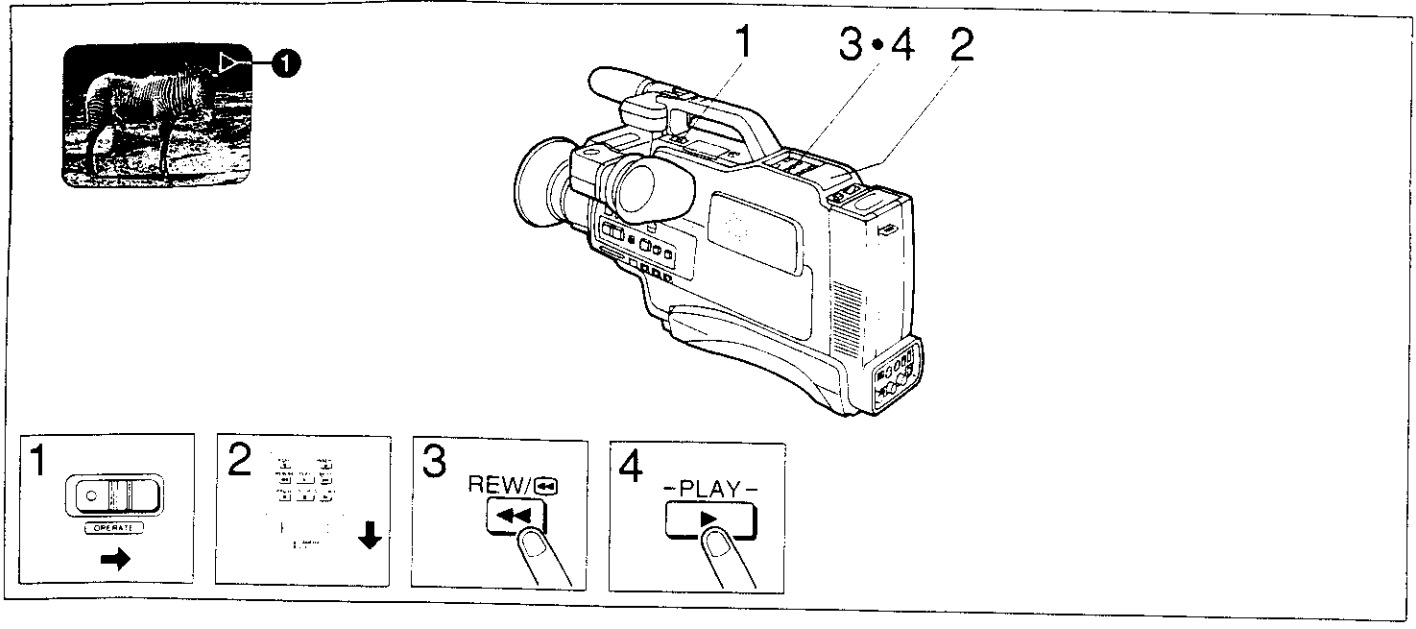
1 Set to "PORTRAIT".

2 Set to "IRIS".

3 Press either button repeatedly to select the desired iris value.

Notes:

- If the scene is too bright or too dark for proper exposure, the Iris Value Indication will change automatically.
- In the Portrait Mode, all functions can be used except the High-Speed Shutter Function. (See page 58.)



Playback

The recorded tape can be played back in the Viewfinder or on a connected TV set.

■ How to Play Back in the Viewfinder

(Playback from the Beginning of the Tape)

1 Turn the Movie Camera on.

2 Slide to "VTR".

3 Press.

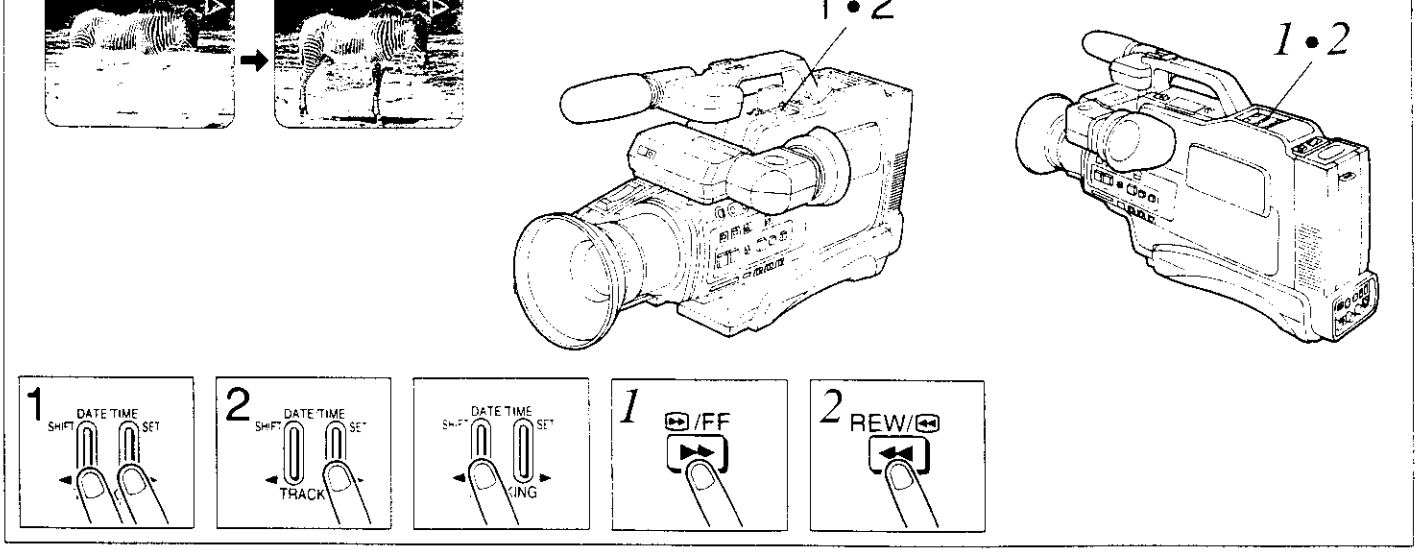
- The tape will stop automatically when it reaches its beginning.

4 Press.

- The playback starts.
  The Playback indication "▷" ❶ appears in the Viewfinder.
- The tape will be rewound automatically when it reaches its end.
- When the [SPEAKER ON/OFF] Switch is set to "ON", the sound can be heard from the built-in speaker.

■ To Stop the Playback...

Press the [STOP] Button.



Playback (cont'd)

■ How to Adjust the Tracking

If the picture is distorted by noise bars during playback, the tracking needs to be adjusted.

1 Press both the [◄ TRACKING] and [TRACKING ►] Buttons simultaneously.

2 Eliminate any noise bars by adjusting the tracking with the [◄ TRACKING] or [TRACKING ►] Button.

- When playing back a video cassette which has been recorded on another movie camera or video tape recorder, it may not be possible to completely eliminate these noise bars.

■ How to Rewind or Fast-forward the Tape

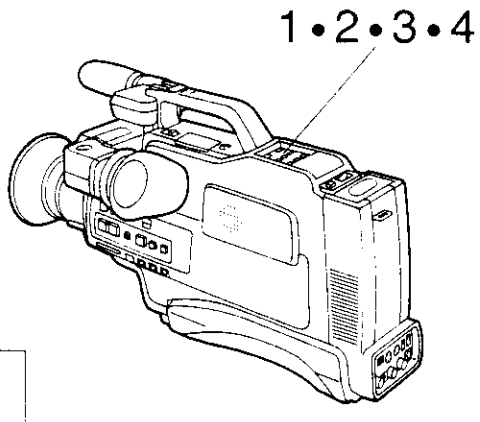
With the Movie Camera in the stop mode:

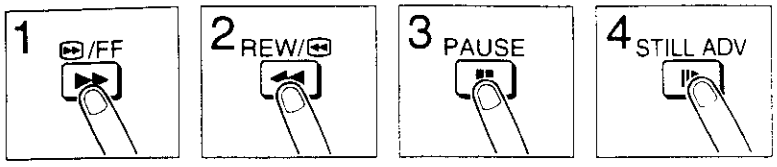
1 Press to wind the tape forward at high speed.

- The tape will be rewound automatically when it reaches its end.

2 Press to rewind the tape at high speed.

- The tape will stop automatically when it reaches its beginning.





Playback (cont'd)

During Normal Playback

■ For Cue Playback

1 Keep pressed.
- The Fast Forward/Cue Mode Indication "▷▷" ❶ appears in the Viewfinder.

■ For Review Playback

2 Keep pressed.
- The Rewind/Review Mode Indication "◁◁" ❷ appears in the Viewfinder.

■ For Still Playback

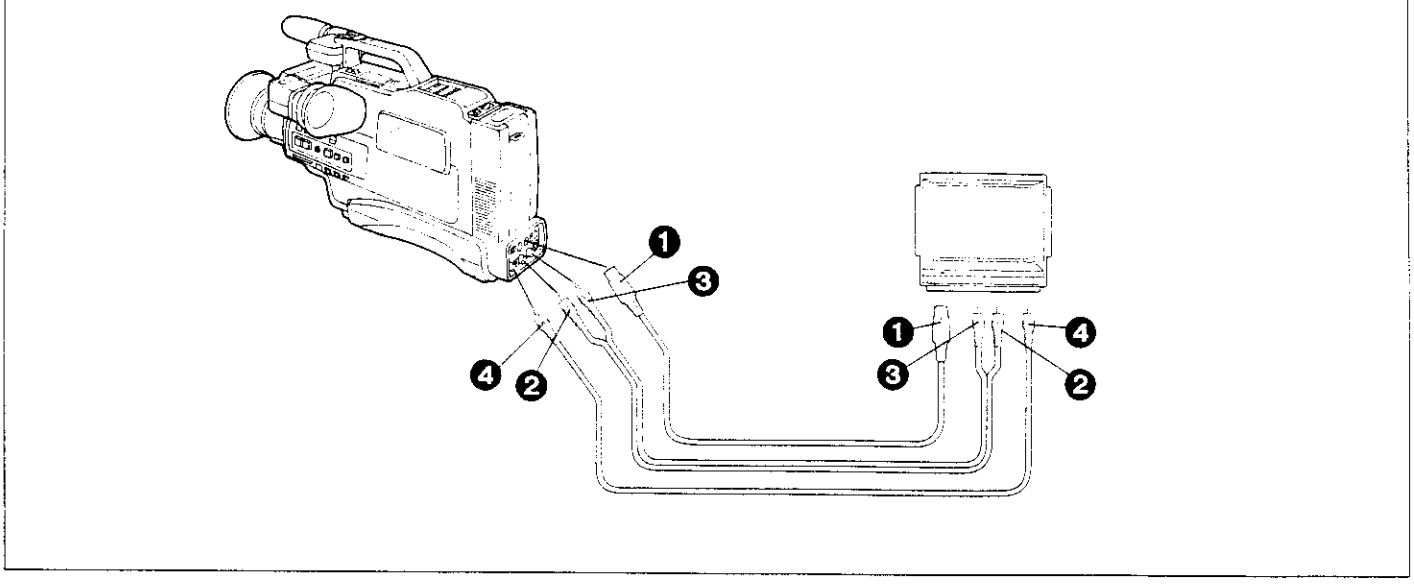
3 Press.
- The Still Mode Indication "❚❚" ❸ appears in the Viewfinder.

■ For Still Advance Playback
(During Still Playback)

4 Keep pressed.

To Resume Normal Playback
Press the [PAUSE] Button again.
If the Movie Camera is left in the Still Playback Mode for about 6 minutes, it will switch over to the stop mode, to protect the tape and the video heads.

Note:
The sound will be played back only during normal playback (if connected to a TV set).



Playback via a TV Set (Connections)

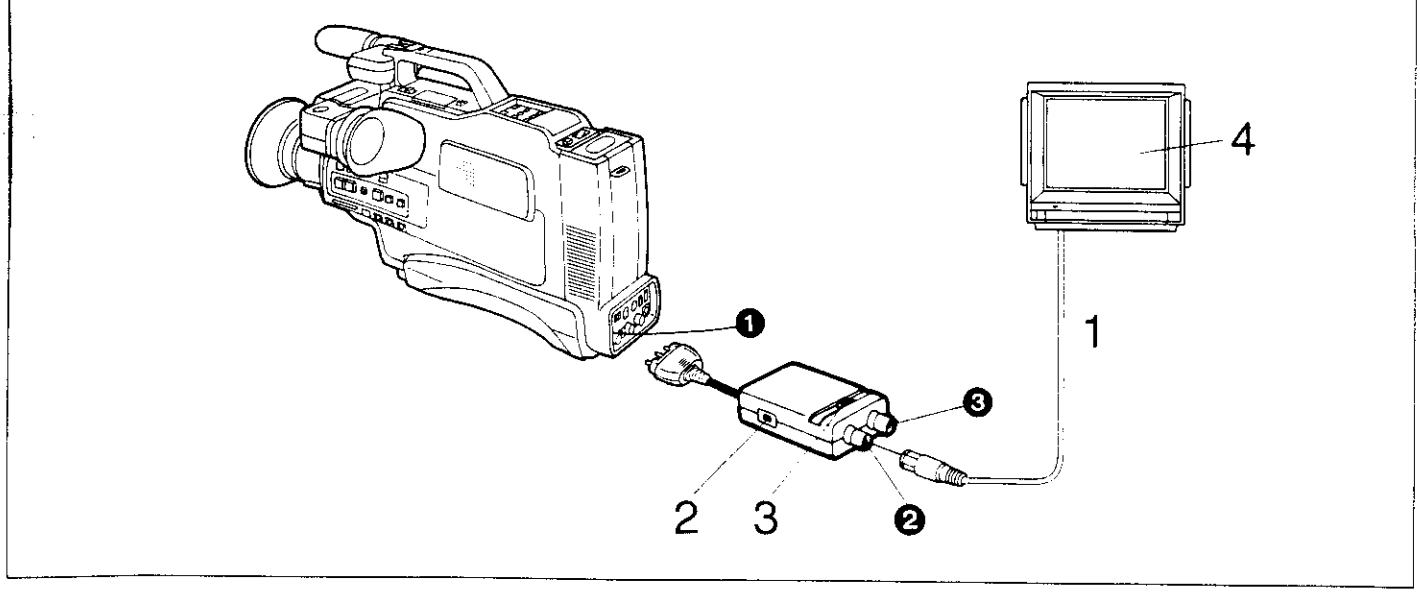
■ Playback via a TV set with S-Video Input Socket

•Turn off the Movie Camera and the TV set.

Connect the Movie Camera to the TV set.
(S-Video Cable and Audio/Video Cable are supplied.)

Movie Camera		TV Set
S-Video Output Socket ❶	⟷	S-Video Input Socket ❶
Audio Output Socket (L) ❷	⟷	Audio Input Socket (L) ❷
Audio Output Socket (R) ❸	⟷	Audio Input Socket (R) ❸
Video Output Socket ❹	⟷	Video Input Socket ❹

■ **Activate the Playback Operation**
(See page 47.)

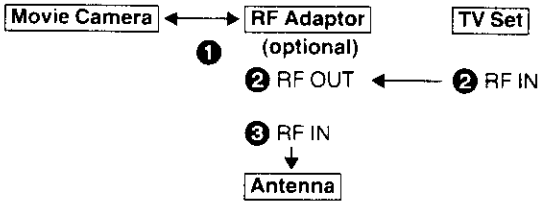


Playback via a TV Set (cont'd)

■ Playback via a TV Set without AV Socket

•Turn off the Movie Camera and the TV set.

1 Connect the Movie Camera to the TV set.



2 Set the PAL System Selector Switch to the correct position.

•Set to "G" for continental Europe. If set to the wrong position, the sound will be muted.
•Set to "I" for the UK.

3 Set the TV/VTR Selector Switch on the RF Adaptor to:

VTR: For playing back a video cassette.
TV: For watching TV.

4 Select an unused TV programme position (channel).

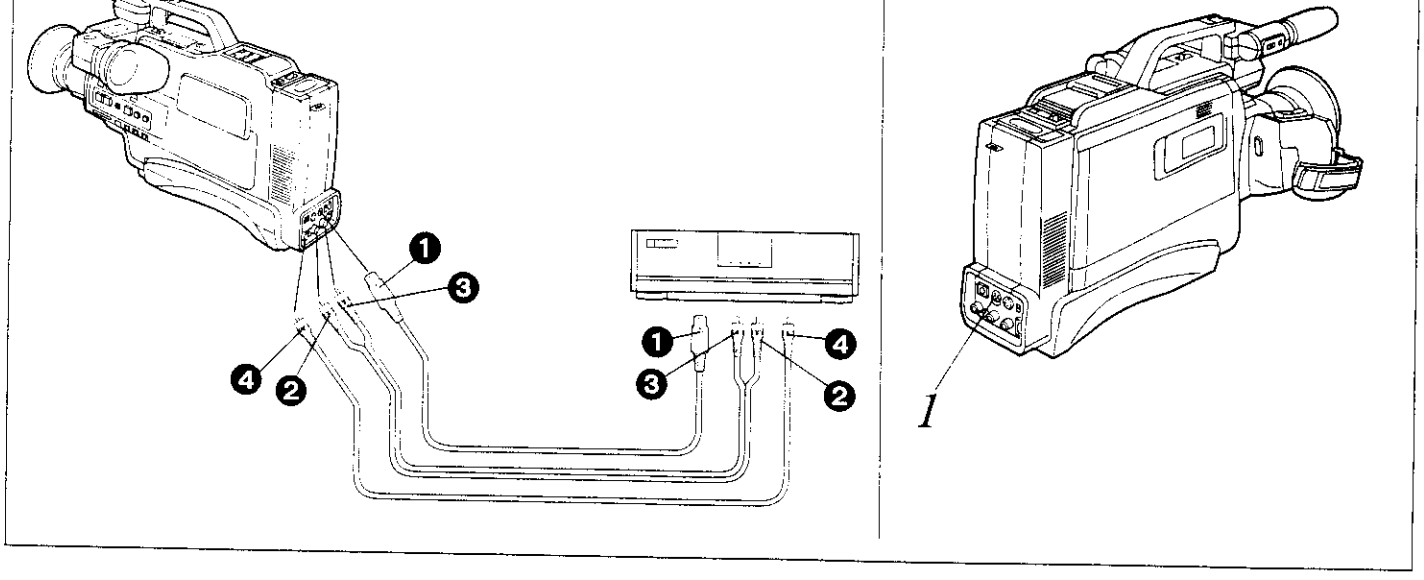
•Follow the tuning procedure outlined in the instruction booklet for your TV set to re-tune your TV set to the UHF transmission channel 36. The camera picture now appears on the TV screen.
•If in doubt, consult your local video dealer.

■ Activate the Playback Operation

(See page 47.)

Australia model only:

FOR YOUR SAFETY:
Install any external aerial to AS 1417.1



Copying (Dubbing)

■ Connections

1 Connect the Movie Camera to a VTR.

Using the Supplied S-Video Cable and Audio/Video Cable

Movie Camera		Video Tape Recorder
S-Video Output Socket ❶	⟷	S-Video Input Socket ❶
Audio Output Socket (L) ❷	⟷	Audio Input Socket (L) ❷
Audio Output Socket (R) ❸	⟷	Audio Input Socket (R) ❸
Video Output Socket ❹	⟷	Video Input Socket ❹

■ Operations

Movie Camera

1. Insert a recorded video cassette into the Movie Camera.
2. Press the [PLAY] Button (and if necessary the [⏩/FF] or [REW ⏪] Button to locate the scene from where the dubbing is to start).
3. Press the [PAUSE] Button at the point where the dubbing is to start.
6. Press the [PAUSE] Button to start the playback.
8. Locate on the Movie Camera the beginning of the next scene to be dubbed, and press the [PAUSE] Button at that point.

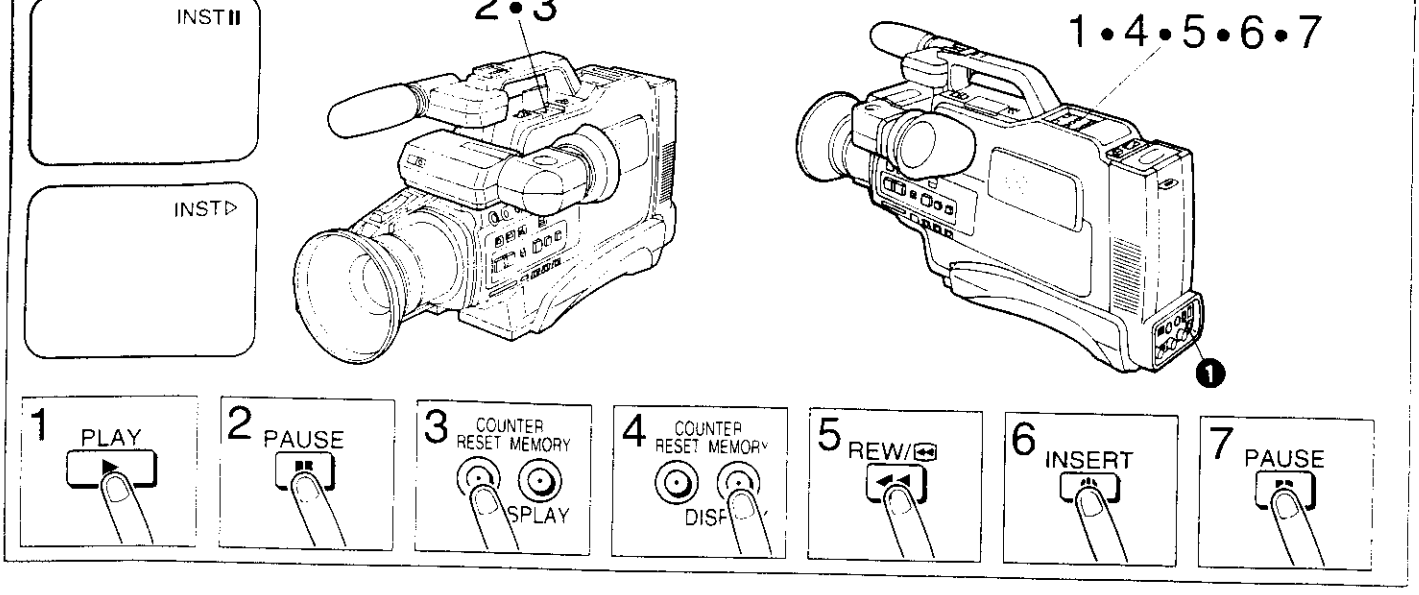
Video Tape Recorder (VTR)

4. Insert a video cassette with intact erasure prevention tab into the VTR.
5. Press the Record Button to start recording.
7. Press the Pause/Still Button at the exact position where the recording is to end.
   - The VTR is now in the recording pause mode.
9. Press the Pause/Still Button again to resume recording.

- Repeat the operation steps 6 to 9 for each additional scene to be dubbed.

1 **Edit Socket**

By connecting an Editing Controller (optional) to this socket as well as to a VTR equipped with Edit Socket, highly precise and speedy editing becomes possible.



Insert Editing

Replacing pictures on a recorded tape with new scenes. (The original sound remains.)

1 **Press.**

2 **Press.**
- Play back the tape to locate the point where the Insert Editing is to finish, and press the Pause Button at that point.

3 **Press.**

4 **Press.**
- The indication "M 0000" appears in the EVF.

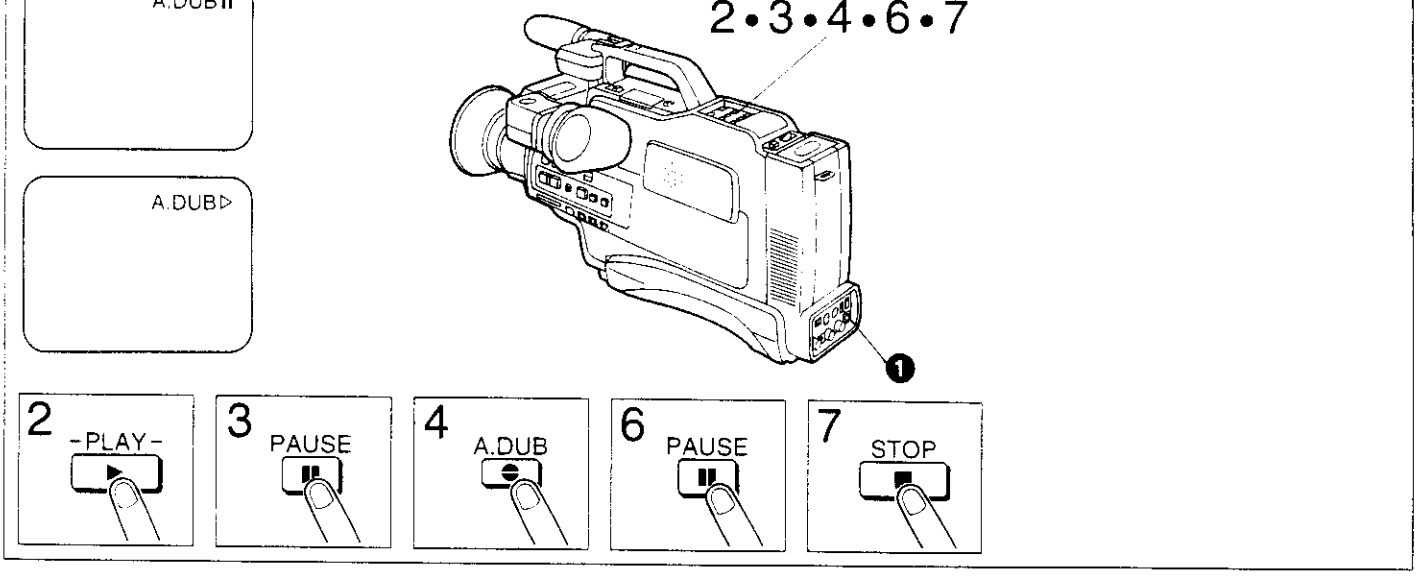
5 **Press.**
- Rewind the tape to locate the point where the Insert Editing is to start, and release the button at that point.

6 **Press.**

7 **Press again.**
- The Insert Editing starts.

The Insert Editing will automatically finish at the point where the counter indicates "M 0000".
- To stop the Insert Editing midway, press the Pause Button.

■ **When playing back a cassette tape on which insert editing has been performed...**
Use the [HiFi/MIX/NORMAL] Switch ❶ to select the sound to be played back. (See page 22.)



Audio Dubbing

Audio Dubbing can be performed by using the stereo microphone or an external microphone.

1 **Insert the recorded cassette.**
- Insert a video cassette with intact tab.
  If the tab is removed, cover the hole with adhesive tape.
  (See page 19.)

2 **Press.**
- Play back the tape to locate the point where you want to start the Audio Dubbing.

3 **Press.**

4 **Press.**

5 **Operate the audio source unit.**

6 **Press again.**
- The Audio Dubbing starts.

7 **Press.**
- The Audio Dubbing stops.

■ **When playing back a cassette tape on which audio dubbing has been performed...**
Use the Audio Selector Switch ❶ to select the sound to be played back. (See page 22.)

VITC signals

This Movie Camera is equipped with a built-in VITC Generator and it automatically records VITC signals (Vertical Interval Time Code). It can count up continuously from 0 to a maximum of 24 hours. Using a VITC Editing Controller System (optional), cassette tapes recorded with VITC signals can be edited more conveniently and with frame-by-frame precision.

Note:
For actual editing, refer to the Operating Instructions of the VITC Editing Controller System.

- A built-in lithium battery ensures that the last time code value reached before the recording was interrupted is always retained in memory. Thus when camera recording is resumed later, the time code sequence continues from the point where it was halted, even if the Movie Camera was switched off.

Cautions for Shooting with VITC Time Code
To ensure that the desired scenes can be found during editing, the time code must be recorded continuously without any gaps.

1. Provide a blank leader portion at the beginning of each video cassette by leaving the Lens Cap on the Lens and starting to shoot. Continue shooting like this for at least 20 seconds.
2. Each time you start the Movie Camera, small jumps may appear in the time code. These jumps would make editing of the first frames of a scene difficult. Therefore, get into the habit of always starting the camera approx. 5 seconds before the actions you wish to record actually start.
3. Do not wind the tape in the video cassette forwards or backwards after taking a shot. The successive shots must be recorded in continuous sequence.
4. Do not use the Camera Search or Rec Review Function.
5. Never make new recordings over parts of a previously recorded video cassette.

Cautions

Please read these cautions before operating the Movie Camera and its accessories.

Video Head Clogging

The video heads are the means by which the Movie Camera places picture signals on the tape during recording, and reads picture signals from the tape during playback. If these heads become dirty and clogged from long use, the signals can no longer be recorded or played back correctly. This is the case, if the sound of a tape during playback is reproduced normally, but the picture is not visible or greatly distorted. When such symptoms occur, have the Movie Camera checked by qualified service personnel.
This Movie Camera is equipped with Head Clogging Detection Function. When the heads are clogged, the " ⊗ " indication in the Viewfinder will appear. As the accumulation of dirt on the heads may be dislodged by the movement of the tape, it is possible that this indication sometimes appears, but may not reappear on the next recording start.
The Head Clogging Detection Function will be activated when the shooting is started from the shooting pause mode. However, it will not be activated when shooting immediately after replacing the cassette and after playing back some part of the tape.

If Condensation Forms Inside the Movie Camera

Condensation (dew) forms when warm air comes in contact with a cold object, for example on a window in a heated room in winter. Condensation may also form in the Movie Camera and damage the tape and the video heads, if:

- The Movie Camera is in a room where the heater has just been turned on.
- The Movie Camera is in a room with steam or high humidity.
- The Movie Camera is brought from cold surroundings into a well-heated room.
- The Movie Camera is suddenly brought from cool surroundings, such as an air-conditioned room or car, to a place which is hot and humid.
- When condensation has formed inside the Movie Camera, the "DEW" Indication in the Viewfinder will flash and a few seconds later, the Movie Camera will turn itself off to protect the tape and the video heads.
  After a while, turn the Movie Camera on again and make sure that the "DEW" Indication is not displayed any more. Then, wait about 1 hour before operating the Movie Camera again. Depending on the surrounding conditions, it may take several hours before the Movie Camera can be used again.
- As condensation forms gradually, it may take about 10–15 minutes before the Movie Camera turns itself off after a change of working environment.
- In an extremely cold place, condensation may freeze and turn into frost. In this case, it may take quite some time for the frost to melt, turn into dew and evaporate.
- When you bring the Movie Camera from a very cold place, e.g. the ski slopes, into a heated room, keep it in a tightly closed plastic bag or similar to prevent condensation from forming inside the Movie Camera.

Cautions for the Movie Camera

In case of abnormal operation of this unit (e.g. if it emits smoke or some unusual smell), immediately stop the operation and consult qualified service personnel.

■ Cautions for Use:

- Do not disassemble or reconstruct this unit. Some internal parts of this unit have high voltage. Disassembling or reconstructing is very dangerous and may cause serious damage to the unit.
- Never put any objects inside.
  Never insert any metal objects or inflammable material through any of the openings (cassette compartment, etc.). If any liquid is spilled into the unit, immediately stop the operation and consult qualified service personnel.
  Operating the unit with some foreign matter inside may cause malfunction or electric shock.
  If children have access to this unit, special attention should be paid to this point.
- Never aim the lens at the sun because this could cause permanent damage to the CCD image sensor. Such damage could manifest itself in reduced picture quality or could make shooting altogether impossible. Attention should be paid to this point not only during shooting but during other operations as well.
- Never subject the unit to strong vibrations or shocks.
  Shocks during use may result in picture distortion.
- Do not use this unit during a thunderstorm, especially not in a large open field, because this would be very dangerous.
  If used indoors during a thunderstorm, be sure to disconnect the AC Adaptor from the mains outlet.
- Never use this unit with the cassette compartment facing down, because this could cause uneven winding, slacking and damage to the tape.
- Do not use the viewfinder as a carrying handle when transporting the unit.

Cautions (cont'd)

■ **Cautions for Surroundings:**
- Do not use this unit in any place where water or some other liquid could splash on it.
- Do not operate this unit very near a TV set or radio, because this could negatively influence the picture and sound reception.
- Keep this unit away from areas with strong electric fields, because they could impair the proper functioning of this unit and cause picture distortion.
- Keep this unit away from objects emitting high temperature, such as heaters.
- Do not insert video cassettes into the unit or take them out from it in dusty places.
- It is not possible to use this unit in the water. If it is accidentally dropped into water (or some other liquid), disconnect it from the AC Adaptor, take it out of the water, and then consult qualified service personnel.

■ **Cautions for Connections:**
- Before connecting, confirm that all systems are turned off and that the connecting cables are not damaged.
- Do not expose the connection cables to high temperaturs, chemicals and objects with sharp edges; also do not bend the cables excessively.

■ **Cautions for Storage and Transportation:**
- Do not leave this unit in places exposed to direct sunlight (e.g. a closed car in summer) or near heaters. Excessive heat could deform the body or cause other damage to the unit.
- The packing materials in which the unit is shipped are designed for optimum protection. Keep them for transporting the unit in the future.
  Store the unit and video cassettes away from magnetized objects such as toys containing motors and batteries.
- Do not leave this unit in places with high temperature and high humidity such as in a closed car or in places with steam or oily smoke.
  If this unit is left in a damp place for a long time, mold could form on and damage the lens.
- Do not leave this unit in contact with rubber or plastic products for a long time, because it could cause deformation and discoloration of the body.

■ **After Use:**
- Be sure to attach the Lens Cap.
- When this unit is connected to the AC Adaptor, turn this unit off before unplugging the AC Adaptor.
- When this unit is not going to be used for a longer period of time, remove the cassette before turning this unit off.
- When the unit is not going to be used for a long period of time, turn the unit on occasionally to prevent malfunction.

Cautions for the Battery Pack

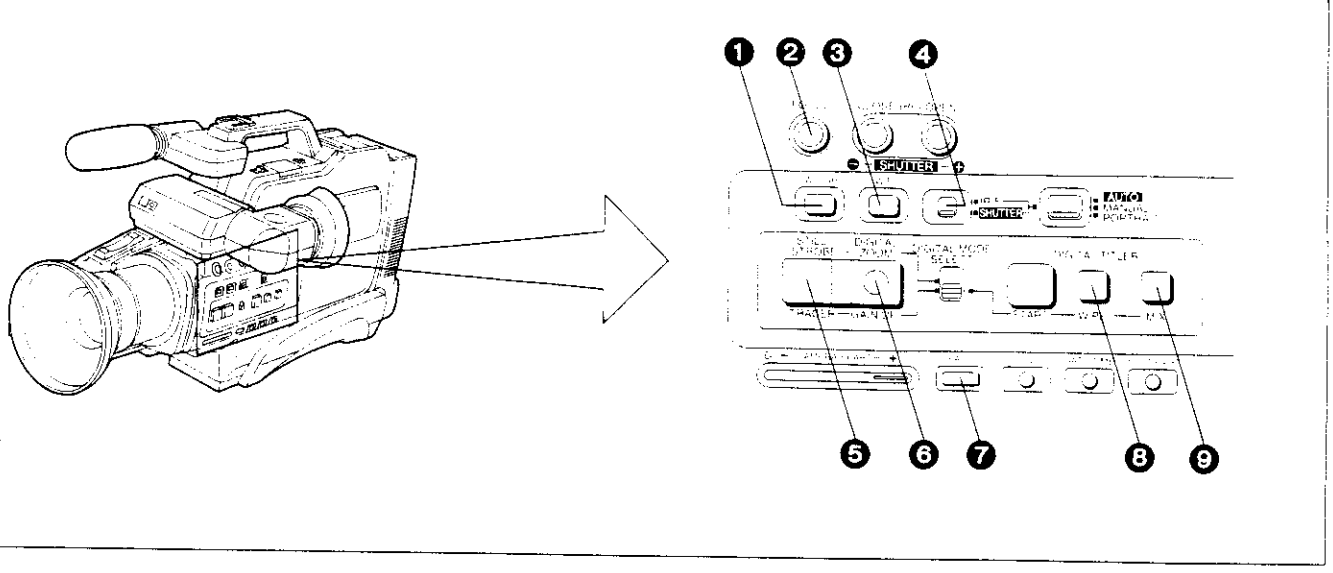
The function of the Battery Pack is based on a chemical reaction. Pay attention to the following points when using it.
- If charged at low temperatures, the operation time of the Battery Pack becomes shorter.
- For recharging, use the specially designed AC Adaptor only.
- Charge the Battery Pack within a temperature range of 10°C–35°C. At higher or lower temperatures, the Battery Pack cannot be charged to its full capacity.
- Do not recharge the Battery Pack when it is already fully charged.
- If, in spite of normal recharging, the operation time of the Battery Pack becomes too short for practical use, the service life of the Battery Pack has reached its end. Replace it with a new one.
- During operation of this unit or during recharging, the Battery Pack may become warm. However, this does not pose any problem.
- When the Battery Pack is not being used, remove it from the Movie Camera or the AC Adaptor.
- Do not short-circuit the connectors nor disassemble or reconstruct the Battery Pack.
- Do not throw the exhausted Battery Pack into a fire.

■ **Cautions for Storing the Battery Pack:**
- Do not store the Battery Pack in contact with metal objects because they could short-circuit the connectors of the Battery Pack and exhaust it.
- Do not leave the Battery Pack at places with high temperature, e.g. on the dashboard of a car or other places exposed to direct sunlight.

Cautions for the AC Adaptor

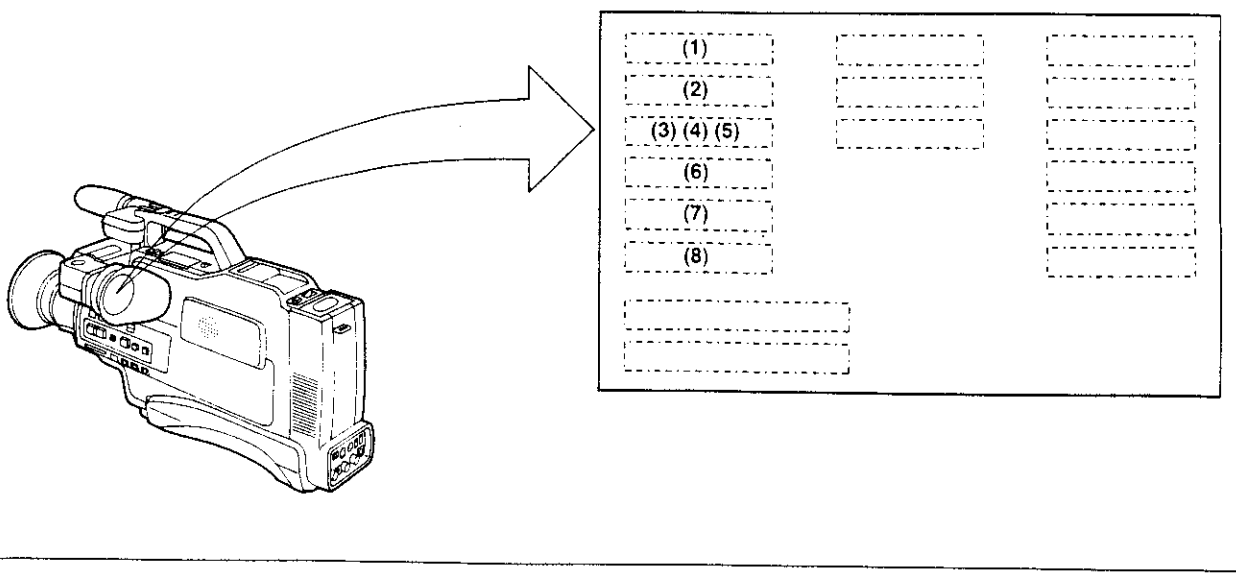
- Before connecting the AC Adaptor to an AC wall outlet, confirm that the voltage on the rating plate matches your local AC mains voltage.
- When not using the AC Adaptor, unplug its mains cable.
- Do not use the AC Adaptor for any purposes other than supplying the unit with power and charging the Battery Pack.
- When unplugging the mains cable, pull it by the plug, not by the cable.
- When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio farther away from the AC Adaptor.
- Do not place any heavy objects on the AC Adaptor.
- Before cleaning the AC Adaptor, make sure that it is disconnected from the AC mains socket.

Be sure to obtain a warranty card from the shop at the time of purchase, and make sure that it contains all necessary information.



Possible Use of the Functions Buttons in the Different Operation Modes

Operation Buttons		Mode Selector Switch		
		AUTO	MANUAL	PORT-RAIT
❶ [LOW LIGHT] Button		No	Yes	Yes
❷ [FOCUS] Button		No	Yes	Yes
❸ [W.B] Button		No	Yes	Yes
❹ [IRIS/SHUTTER] Switch	IRIS	No	Yes	Yes
	SHUT-TER	No	Yes	No
❺ [STILL/STROBE]/ [TRACER] Button		Yes	Yes	Yes
❻ [DIGITAL ZOOM]/ [GAIN UP] Button		Yes	Yes	Yes
❼ [FADE] Button		Yes	Yes	Yes
❽ [WIPE] Button		Yes	Yes	Yes
❾ [MIX] Button		Yes	Yes	Yes



Indications in the Viewfinder

(1) Recording System indications

"S" S-VHS system recording

- When the "S" Indication is not visible the recording is made in the VHS system.
- The recording system can be changed by sliding the [S-VHS ON/AUTO/OFF] Switch.

(2) Manual White Balance Indications

In the Manual White Balance Adjustment Mode:

" " Indication flashes slowly ..... Adjustment is not made.

" " Indication flashes rapidly ..... While adjustment is being performed.

" " Indication is lit..... The adjustment has been completed.

In the Automatic White Balance Adjustment Mode (initial mode), none of these indications is lit.

(3) Tracer Indication

"TRACER"

When the [TRACER] Button is pressed, the "TRACER" Indication appears

(4) Digital Wipe Indication

"D.WIPE"

- When the [WIPE] Button is pressed, the "D.WIPE" Indication appears.

(5) Digital Mix Indication

"D.MIX"

- When the [MIX] Button is pressed, the "D.MIX" Indication appears.

(6) High Sensitivity Indication

At every press of the [GAIN UP] Button, the indication changes in the following order:

no indication→"GAIN ×4"→"GAIN ×8"

(7) Low Light Indication

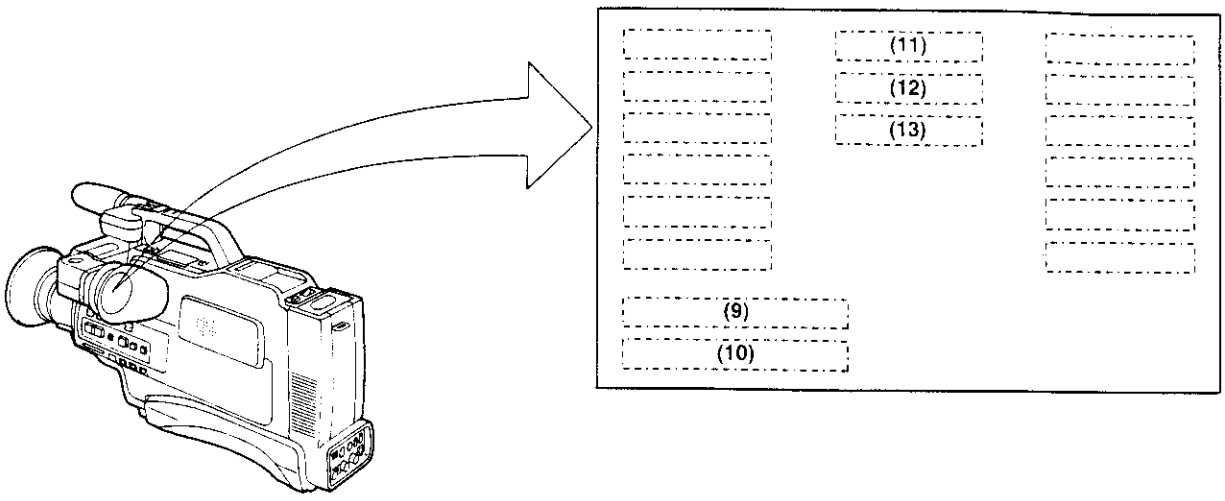
"LOW L"

- When the [LOW LIGHT] Button is pressed, the "LOW L" Indication appears.

(8) Self-Timer and Interval Indications

At every press of the [TIMER/INTERVAL REC] Button, the indication changes in the following order:

no indication→"SLF20"→"SLF"→"INT"



Indications in the Viewfinder (cont'd)

(9) Time Indication

"12:30"

- The current time (hour and minute) is displayed. The time must initially be set.
- The time is shown in the 24-hour clock system.
- It is possible to display the date alone, or the time and date together.

(10) Date Indication

"15.10.1993"

- The year, month, and day are displayed. The date must initially be set.

(11) Remaining Battery Power/Index Indication

"E----F"

- The "—" indications begin to disappear from right to left as the power of the Battery Pack is being used up.

"INDEX"

- This indication flashes when a recording is started and it indicates that an index signal is being recorded.

(12) Tape Counter/Elapsed Tape Time Indication

"0123"

- When a cassette tape is ejected, the tape counter is automatically reset to "0000".

"M 0123"

- To be able to play back a certain scene at a later time, press the [MEMORY/DISPLAY] Button at the beginning of that scene. When the [⏩/FF] Button or the [REW/⏪] Button is later pressed, it is possible to easily locate this scene. ("M" means Memory.)

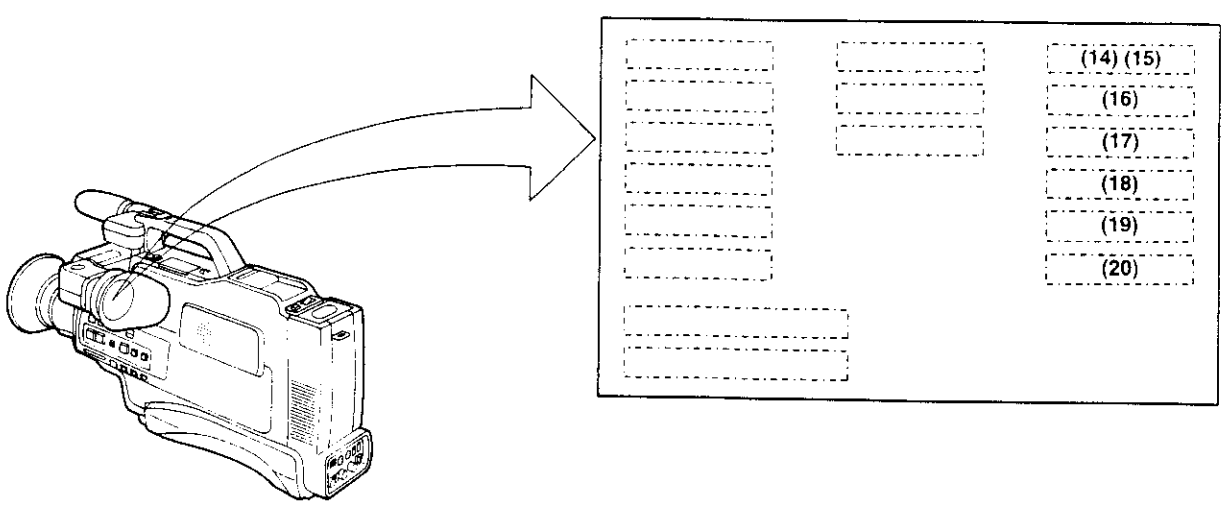
"L 0:00.00"

- The Lap Time Counter counts up only during recording.

(13) Warning/Alarm Indications

The following indications are displayed to inform about the conditions of the Movie Camera.

"DEW", "⊗", "📼", "▭", "⊘" and "END".



Indications in the Viewfinder (cont'd)

(14) Tape Running Indications

Depending on the operation being currently performed by the Movie Camera, one of the following indications appears.

"▷"	During Playback
	Camera Search (in forward direction)
"▮▮"	During Still Playback
"◁◁"	Rewind/Review Mode
	Camera Search (in reverse direction)
"▷▷"	Fast Forward/Cue Mode
INST ▷	Insert Editing mode
INST ▮▮	Insert Editing Pause mode
A.DUB ▷	Audio Dubbing mode
A.DUB ▮▮	Audio Dubbing Pause mode

(15) Shooting Mode Indications

"REC"	During Shooting
"PAUSE"	During Shooting Pause
"CHK"	During Rec Review

(16) Magnification Ratio Indication

- It appears when the Movie Camera is turned on.

(17) F Number Indication

The desired F Number can be selected by repeatedly pressing the [CLOSE −] or [OPEN +] Button.

OP+G1, OP+G2, OPEN, F2, F2.4, F2.8, F3.4, F4, F4.8, F5.6, F6.8, F8, F9.6, F11, F14, F16, F19, CLOSE

(18) Shutter Speed Indications

The desired shutter speed can be selected by repeatedly pressing the [CLOSE −] or [OPEN +] Button. The numbers in the Shutter Speed Indication show fractions of a second. e.g. 1/120 = 1/120th of a second.

1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000

- The initial shutter speed is 1/50 sec. (no indication).

(19) Manual Focus Indication

"MF" ("MF" means Manual Focus.)

Pressing the [FOCUS] Button will turn the Automatic Focus Mode on or off. The "MF" Indication indicates that the Manual Focus Mode is selected.

- Initially, the Auto Focus Mode is selected ("MF" Indication is off).

(20) Digital Zoom Indication

"D.ZOOM 1", "D.ZOOM 2"

- Turn the Digital Zoom Function on or off by pressing the [DIGITAL ZOOM] Button. "D.ZOOM 1" or "D.ZOOM 2" is indicated when it is turned on. ("D" means Digital.)

Before Requesting Service

Power Source

Symptom	Cause	Action	Reference Pages
•When using the Battery Pack: Movie Camera does not turn on.	•Battery Pack is not attached.	•Attach it correctly.	12
	•Battery Pack is not charged.	•Charge it.	11
•When using the Battery Pack: Movie Camera turns off soon.	•Battery Pack is exhausted.	•Use a fully charged one.	11
	•Shooting was paused for more than 6 minutes.	•Slide the [OPERATE] Switch backward to turn the Movie Camera on.	24
•When using the AC Adaptor: Movie Camera does not turn on.	•AC Adaptor is not connected.	•Connect AC Adaptor correctly to Movie Camera.	13
•Movie Camera turns off soon.	•Dew has formed inside.	•Wait serveral hours.	56

Shooting

•No picture appears in the Viewfinder.	•Movie Camera does not turn on.	•Slide the [OPERATE] Switch backward to turn the Movie Camera on.	24
	•Lens Cap is attached.	•Remove it.	18
•Indications in the Viewfinder are not clear.	•Eyepiece Corrector is not adjusted.	•Adjust it.	16
	•Lens is covered with dust or dirt.	•Clean it.	17
•Shooting cannot be started.	•Tab of the inserted cassette is broken out.	•Cover the tab hole with adhesive tape.	19
	•No cassette is inserted.	•Insert a cassette with intact erasure prevention tab.	19
	•Tape has reached its end.	•Insert a new video cassette.	19
•Date and time cannot be recorded.	•Date and time are not set.	•Set the date and time.	14
•Date and time are not displayed in the Viewfinder.	[DATE/TIME] Button was not pressed.	•Press the [DATE/TIME] Button	16

Playback

•No playback picture is reproduced.	•Movie Camera does not turn on.	•Slide the [OPERATE] Switch backward to turn the Movie Camera on.	47
	•Movie Camera is not connected to TV set or it is connected incorrectly.	•Connect Movie Camera to TV set correctly.	50
	•Wrong channel is selected on TV set.	•Select the correct channel.	—
•Picture contains noise bars.	•Cue, Review or Still Playback is being performed.	•This is not a malfunction.	49
•Picture is not in colour or distorted.	•Tracking is not adjusted.	•Adjust the tracking on the Movie Camera.	48

Specifications

NV-MS4A — Information for your safety.

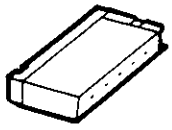
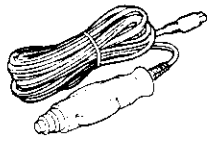
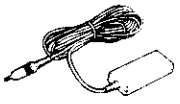
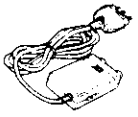
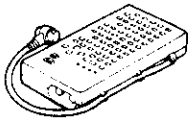
Power Source:	DC 12.0 V		
Power Consumption:	Recording mode; 9.3 W (Battery Operation)		
Video Recording System:	4 Rotary heads, helical scanning system		
Tape Speed:	23.39 mm/s		
Tape Format:	S-VHS/VHS		
Recording/Playback Time:	240 min. with NV-E240		
FF/REW Time:	Less than 12 min. with NV-E180		
VIDEO			
Television System:	CCIR; 625 lines, 50 fields PAL colour signal		
Modulation System:	Luminance; FM azimuth recording Colour signal; Converted subcarrier phase shift recording		
Output Level:	Video out (PHONO);	1.0 Vp-p,	75 ohm unbalanced
	S-VIDEO OUT Terminal;	1.0 Vp-p,	75 ohm unbalanced
AUDIO			
Input Level:	MIC IN (M3);	−70 dB,	4.7 kohm unbalanced
Output Level:	Audio out (PHONO);	−8 dB,	47 kohm unbalanced
Audio Track:	1 track (Normal-Mono only), 2 channels (Hi-Fi Sound-Stereo)		
Image Sensor:	⅓-inch CCD Image Sensor		
Lens:	12:1 Power Zoom Lens with 2 zooming speeds and Digital AI Auto Focus; Focal Length 5.6–67 mm F1.6 Auto Iris/Manual Iris Filter Diameter 49 mm		
Viewfinder:	0.7-inch Electronic Viewfinder		
Standard Illumination:	1,400 Lux		
Minimum Required Illumination:	1 Lux (Digital Gain Up Mode)		
Video Horizontal Resolution:	S-VHS; More than 400 lines (S-Video Out) VHS; More than 250 lines		
Signal-to-Noise Ratio:	Video; More than 43 dB Audio (Hi-Fi); More than 47 dB (Normal); More than 43 dB		
Audio Frequency Response:	Hi-Fi; 50–20,000 Hz Normal; 80–8,000 Hz		
Operating Temperature:	0°C–40°C		
Operating Humidity:	10%–80%		
Weight:	Approx. 2.7 kg (without Battery Pack)		
Dimensions:	130 (W)×245 (H)×476 (D) mm		

VW-AM10A — Information for your safety.

Power Source:	AC 100–240 V, 50–60 Hz (Automatic voltage adjustment)
Power Consumption:	44 W
DC Output:	DC 12 V 1.8 A (VHS Movie) DC 12 V 1.5 A (Battery pack charging)
Weight:	Approx. 0.62 kg
Dimensions:	80 (W)×54 (H)×196 (D) mm

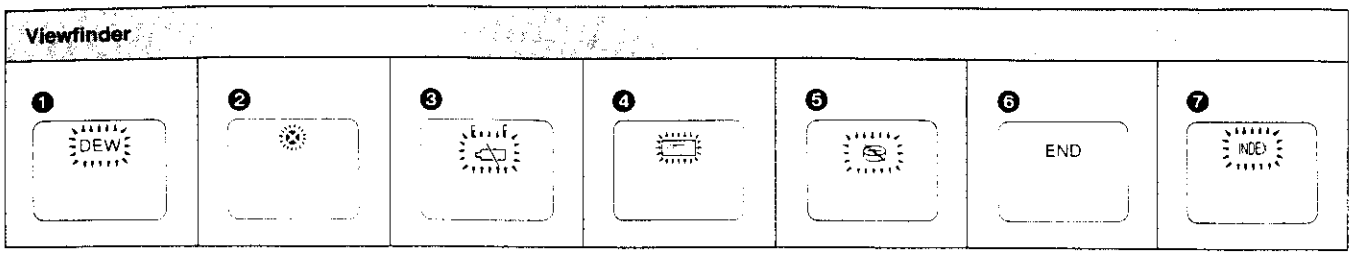
Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Optional Accessories

1. VW-VBF2E 	2. VW-ACM10E 	3. VW-SHM20E	4. VW-LF49E	5. VW-LT2E
6. VW-LW2E	7. VZ-CT55E	8. VZ-CT75E	9. VW-RM1E 	10. VW-RF7E 
11. VW-CG5E 	12. VW-EC310E			

1. Battery Pack
2. Car Battery Cord
3. System Case
4. Filter Kit
5. Tele Conversion Lens
6. Wide Conversion Lens
7. Standard Tripod
8. Deluxe Tripod
9. Pause Remote Control
10. RF Adaptor
11. Charactor Generator
12. Editing Controller

Warning/Alarm Indications in the Viewfinder



These indications are displayed in the Viewfinder to inform you about the conditions of the Movie Camera.

❶ When condensation has formed inside the Movie Camera, the "DEW" Indication flashes and a few seconds later, the Movie Camera will turn itself off.
Press the [TAPE EJECT] Button, remove the video cassette and wait until the "DEW" Indication disappears.

❷ Video Head Clogging.
Consult qualified service personnel.
(See page 56.)

❸ The "—" Indications begin to disappear one after another as the power of the Battery Pack weakens.
When the last bar has disappeared, the Battery Indication "◁□" will flash.
When a Battery Pack is inserted, this indication initially always shows "E————F", regardless of the Battery Pack's charging condition.

❹ There is no video cassette inside, or the tab of the inserted video cassette is broken out.
The indication flashes to warn that shooting is not possible. Insert a video cassette with intact tab. If the tab is broken out, seal the hole with adhesive tape.

❺ When the Lithium Battery (for the Auto Date Function, etc.) is exhausted, this indication will flash for 10 seconds after the Movie Camera has been turned on.

❻ During shooting: The tape has reached its end. Replace the video cassette with a new one whose tab is intact.

❼ It appears few seconds while an index signal is being recorded.